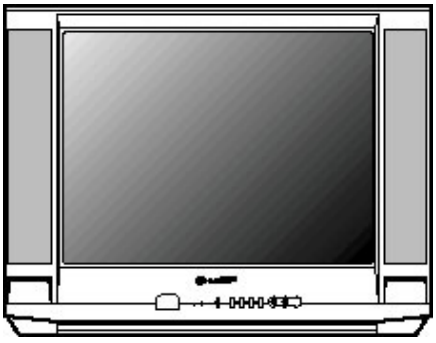
SHARP

SERVICE MANUAL

TVSM012-20/21V-L110M



NTSC SYSTEM
COLOR TELEVISION

GA-1- CHASSIS

MODEL :

20/21V-L110M

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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ELECTRICAL SPECIFICATIONS

POWER INPUT ……..…. 110~230 V AC 60Hz
POWER RATING
- 20V-L110M …….. 72W
- 21V-L110M …….. 75W

PICTURE SIZE
- 20V-L110M ……... 1194 cm^2 (185 sq inch)
- 21V-L110M ……. 1240 cm^2 (192 sq inch)

CONVERGENCE …….. Magnetic
SWEEP DEFLECTION …….. Magnetic
FOCUS …….. QPF Electrostatic
INTERMEDIATE FREQUENCIES
- Picture IF Carrier Frequency …. 45.75 MHz
- Sound IF Carrier Frequency ….. 41.25 MHz
- Color Sub-Carrier Frequency … 42.17 MHz (Nominal)

AUDIO POWER OUTPUT RATING
- 20V-L110M ……..…….. 1.5 + 1.5 W
- 21V-L110M ……..……..…. 1.5 + 1.5 W

SPEAKER SIZE …….. 9 x 5 cm
VOICE COIL IMPEDANCE .. 32 ohm at 400 Hz
ANTENNA INPUT IMPEDANCE
- VHF/UHF …….. 75 ohm Unbalanced

TUNING RANGES
- VHF-Channels …….. 2 thru 13
- UHF-Channels ……..…… 14 thru 69
- CATV Channels ……..…….. 1 thru 125

Specifications are subject to change without prior notice.

SHARP (PHILS.) CORPORATION

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IMPORTANT SERVICE SAFETY PRECAUTION

■ Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulating material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.
   To prevent electrical shock, use an isolation transformer between the line cord and power receptacle, when servicing this chassis.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation, if the high voltage is as specified in the “High Voltage Check” instructions.
   It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in the glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter.
   The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and; also, under certain conditions, may produce radiation in exceeding of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do no use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver.
   Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION
(Continued)

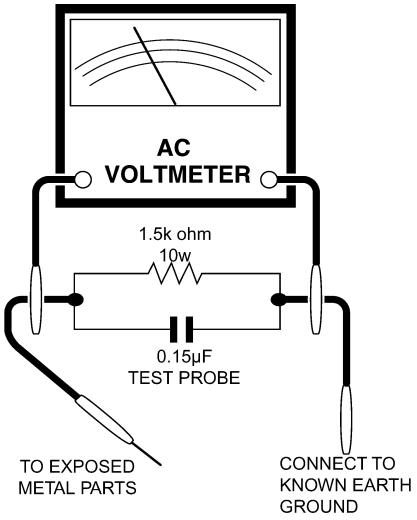
BEFORE RETURNING THE RECEIVER

(Fire & Shock Hazard)

Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators and etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.

- Plug the AC cord directly into a 110~230 volt AC outlet, (Do not use an isolation transformer for this test).
- Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15μF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
- Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.
- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon and etc.) and measure the AC voltage drop across the resistor.
  All checks must be repeated with the AC line cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)
  Any current measured must not exceed 0.5 milliamp. Any measurements not within the limits outlined above indicate of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



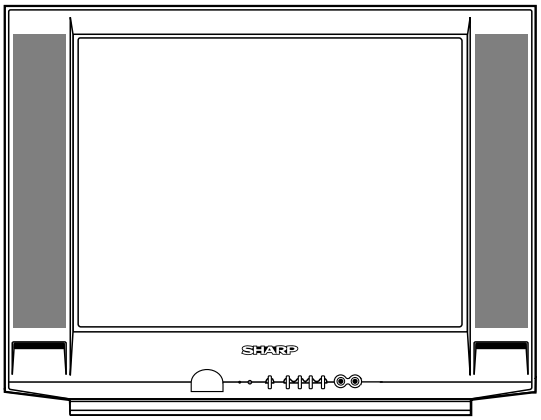
SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics.
These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.
Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

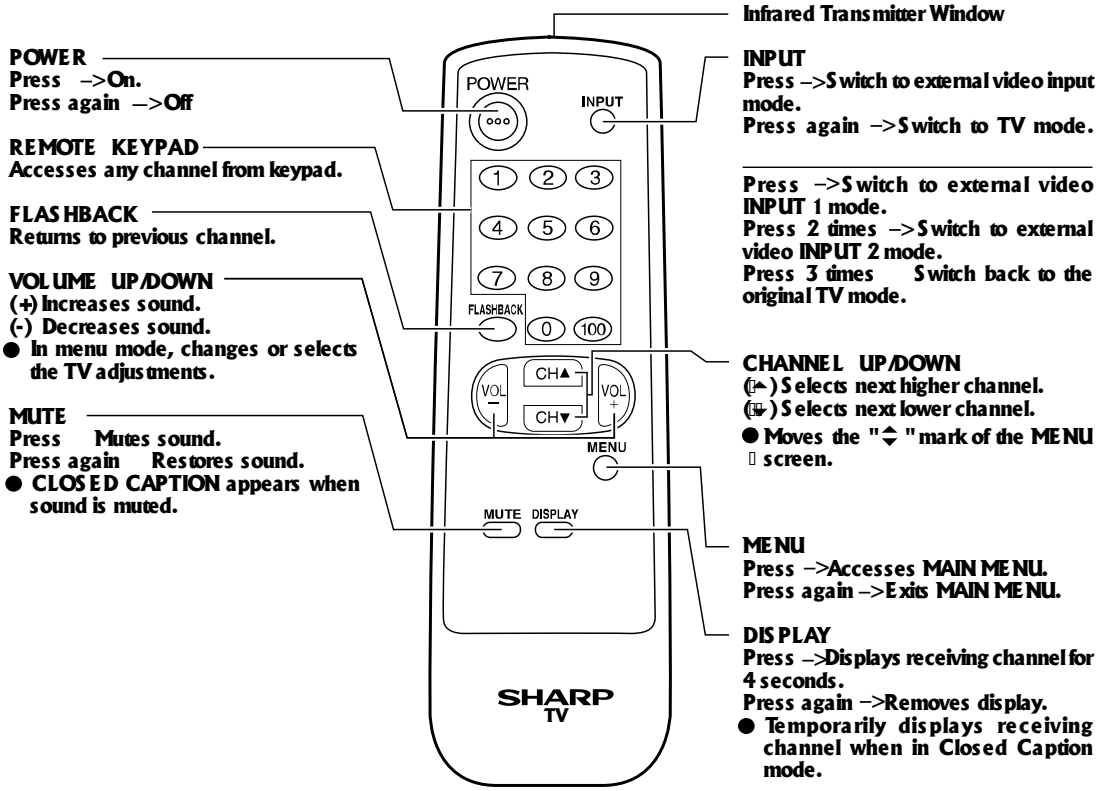
For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

LOCATION OF USER'S CONTROL

Front Panel



Basic Remote Control Functions



INSTALLATION AND SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdrivers or TV alignment tools.
(2) Before performing adjustments, the TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 3.15A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

+B DC REGULATOR CONFIRMATION

The +B DC output voltage adjustment is not included in this circuit. However, should confirmation be required proceed as follows.

1. Actuate receiver with 230V AC input voltage.
2. Receive a local channel.
3. Connect positive lead of digital voltmeter to C754 positive side on PWB-A; negative lead to chassis ground.
4. Confirm this voltage reading is as below.

CAUTION: The reading should be within +130.0 ± 2.0V DC to ensure normal function and circuitry reliability.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, B+ system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 230V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Receive a good local channel.
4. Connect a digital voltmeter to TP653 and make sure that the voltmeter reads 21.4 ± 1.5V.
5. Apply external 27.9V DC at TP653 by using an external DC supply, TV must be shut off.
6. To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652. Now make sure that normal picture appears on the screen.
7. If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 110~230V AC line voltage, with a strong air signal or a properly tuned in test signal.
3. Receive a good local channel.
4. The voltage should be approximately, 25.5kV (at picture MAX bright center condition). 20V-L110M.
   The voltage should be approximately, 26.0kV (at picture MAX bright center condition). 21V-L110M.
   If a correct reading cannot be obtained, check circuitry for malfunctioning components.

For adjustments of this model, the bus data is converted to various analog signals by the D/A converter circuit.

Note: There are still a few analog adjustments in this series such as focus and master screen voltage. Follow the steps below whenever the service adjustment is required. See "Table-B" to determine, if service adjustments are required.

1. Service mode

Before putting unit into the service mode, check that customer adjustments are in the normal mode. Use the reset function in the video adjustment menu to ensure customer controls are in their proper (reset) position.

2. Service item selection

Once in the service mode, press the Ch-up or Ch-down button on the remote controller or at the set. The service adjustment item will vary in increments of one. Select the item you wish to adjust.

3. Data number selection

Press the Vol-up or down button to adjust the data number.

To enter the service mode and exit service mode.

Short JA137 & JA138 for 1 Second and release to switch to the service mode position, and the microprocessor is in input mode. (Adjustment through the I^2C bus control.) To exit the service mode, turn the television off by pressing the power button.

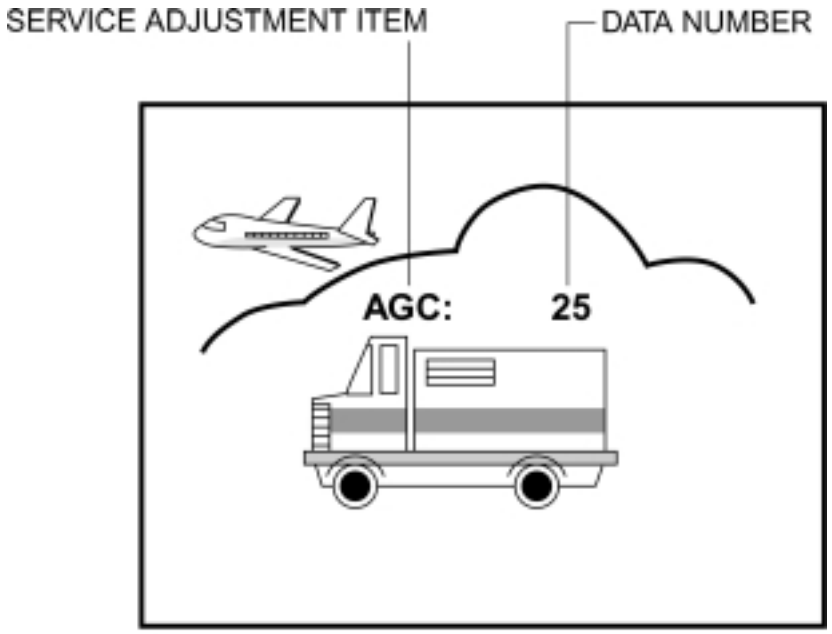
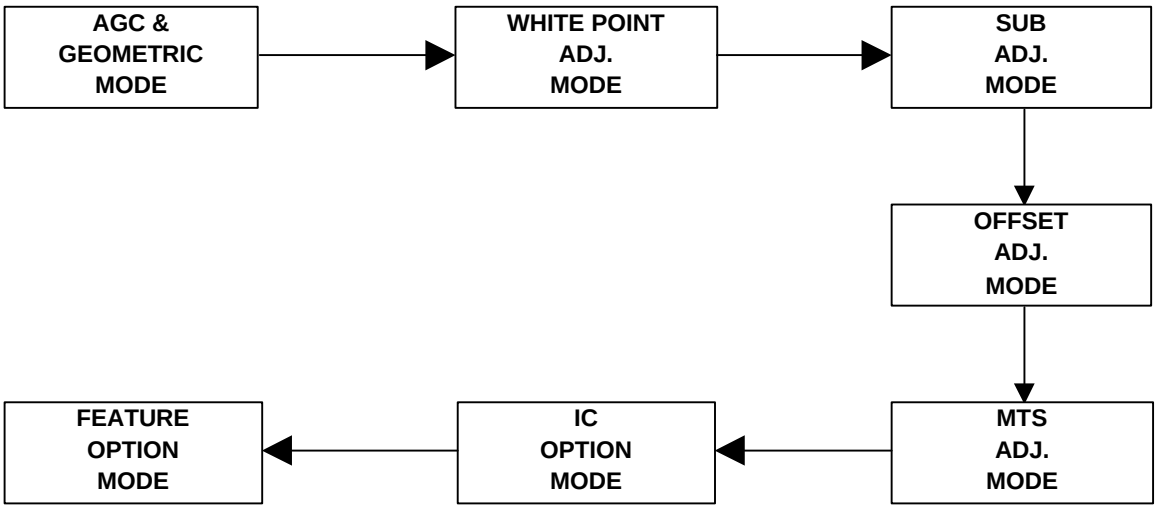


Figure A.

■ SERVICE MODE

(1) In the Service Mode, Key is used to select the mode in the following order.



AGC & GEOMETRIC MODE

AGC TAKE OVER POINT (AGC)
↓
VERTICAL SLOPE (V-LIN)
↓
VERTICAL AMP (V-AMP)
↓
VERTICAL SHIFT (V-CENT)
↓
VERTICAL ZOOM (V-ZOOM)
↓
HORIZONTAL SHIFT (H-CENT)
↓
EAST-WEST WIDTH (H-SIZE)
↓
HORIZONTAL PARALLELOGRAM (EW//)
↓
EAST-WEST PARABOLA/WIDTH (PARA)
↓
EAST-WEST UPPER CORNER PARABOLA (COR(U))
↓
EAST-WEST LOWER CORNER PARABOLA (COR(L))
↓
EAST-WEST TRAPEZIUM (TRAPE)
↓
HORIZONTAL BOW (HB)
↓
S-CORRECTION (S-COR)

WHITE POINT ADJ. MODE

W.P. RED OFFSET HIGH / OFFSET BLUE TONE (DRI-R-HI)
↓
W.P. GREEN OFFSET HIGH / OFFSET BLUE TONE (DRI-G-HI)
↓
W.P. BLUE OFFSET HIGH / OFFSET BLUE TONE (DRI-B-HI)
↓
W.P. RED MH / STD (DRI-R-MH)
↓
W.P. GREEN MH / STD (DRI-G-MH)
↓
W.P. BLUE MH / STD (DRI-B-MH)
↓
W.P. RED OFFSET ML / OFFSET RED TONE (DRI-R-ML)
↓
W.P. GREEN OFFSET ML / OFFSET RED TONE (DRI-G-ML)
↓
W.P. BLUE OFFSET ML / OFFSET RED TONE (DRI-B-ML)
↓
W.P. RED OFFSET LOW (DRI-R-LO)
↓
W.P. GREEN OFFSET LOW (DRI-G-LO)
↓
W.P. BLUE OFFSET LOW (DRI-B-LO)

SUB ADJ. MODE

MAX VOLUME (SUB-VOL)
↓
SUB CONTRAST (SUB-CON)
↓
SUB TINT (SUB-TINT)
↓
SUB COLOR (SUB-COL)
↓
SUB BRIGHTNESS (SUB-BRI)
↓
SUB SHARPNESS (SUB-SHP)
↓
MAX HOTEL VOLUME (HTL-VOL)
↓
HOTEL PROGRAM NO (HTL-PRG)
↓
BLUE BACK CONTRAST (BB-CON)
↓
OSD GRB REFERENCE (RGB)
↓
BLACK LEVEL OFFSET R (CUT-R)
↓
BLACK LEVEL OFFSET G (CUT-G)
↓
CATHODE DRIVE LEVEL (CDL)

20/21V-L110M

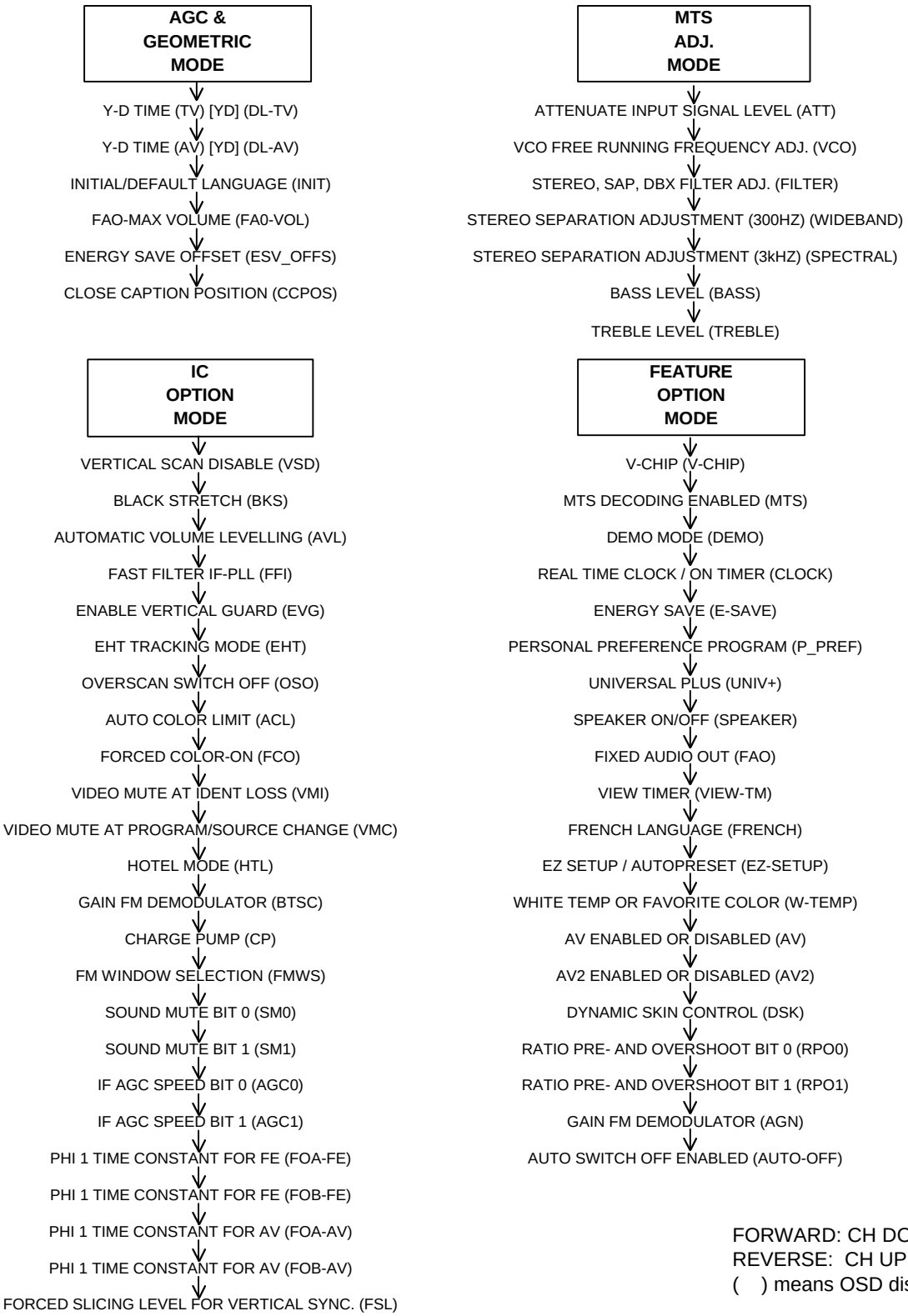

AGC & GEOMETRIC MODE
Y-D TIME (TV) [YD] (DL-TV)
Y-D TIME (AV) [YD] (DL-AV)
INITIAL/DEFAULT LANGUAGE (INIT)
FAO-MAX VOLUME (FA0-VOL)
ENERGY SAVE OFFSET (ESV_OFFS)
CLOSE CAPTION POSITION (CCPOS)
MTS ADJ. MODE
ATTENUATE INPUT SIGNAL LEVEL (ATT)
VCO FREE RUNNING FREQUENCY ADJ. (VCO)
STEREO, SAP, DBX FILTER ADJ. (FILTER)
STEREO SEPARATION ADJUSTMENT (300HZ) (WIDEBAND)
STEREO SEPARATION ADJUSTMENT (3kHZ) (SPECTRAL)
BASS LEVEL (BASS)
TREBLE LEVEL (TREBLE)
IC OPTION MODE
VERTICAL SCAN DISABLE (VSD)
BLACK STRETCH (BKS)
AUTOMATIC VOLUME LEVELLING (AVL)
FAST FILTER IF-PLL (FFI)
ENABLE VERTICAL GUARD (EVG)
EHT TRACKING MODE (EHT)
OVERSCAN SWITCH OFF (OSO)
AUTO COLOR LIMIT (ACL)
FORCED COLOR-ON (FCO)
VIDEO MUTE AT IDENT LOSS (VMI)
VIDEO MUTE AT PROGRAM/SOURCE CHANGE (VMC)
HOTEL MODE (HTL)
GAIN FM DEMODULATOR (BTSC)
CHARGE PUMP (CP)
FM WINDOW SELECTION (FMWS)
SOUND MUTE BIT 0 (SM0)
SOUND MUTE BIT 1 (SM1)
IF AGC SPEED BIT 0 (AGC0)
IF AGC SPEED BIT 1 (AGC1)
PHI 1 TIME CONSTANT FOR FE (FOA-FE)
PHI 1 TIME CONSTANT FOR FE (FOB-FE)
PHI 1 TIME CONSTANT FOR AV (FOA-AV)
PHI 1 TIME CONSTANT FOR AV (FOB-AV)
FORCED SLICING LEVEL FOR VERTICAL SYNC. (FSL)
FEATURE OPTION MODE
V-CHIP (V-CHIP)
MTS DECODING ENABLED (MTS)
DEMO MODE (DEMO)
REAL TIME CLOCK / ON TIMER (CLOCK)
ENERGY SAVE (E-SAVE)
PERSONAL PREFERENCE PROGRAM (P_PREF)
UNIVERSAL PLUS (UNIV+)
SPEAKER ON/OFF (SPEAKER)
FIXED AUDIO OUT (FAO)
VIEW TIMER (VIEW-TM)
FRENCH LANGUAGE (FRENCH)
EZ SETUP / AUTOPRESET (EZ-SETUP)
WHITE TEMP OR FAVORITE COLOR (W-TEMP)
AV ENABLED OR DISABLED (AV)
AV2 ENABLED OR DISABLED (AV2)
DYNAMIC SKIN CONTROL (DSK)
RATIO PRE- AND OVERSHOOT BIT 0 (RPO0)
RATIO PRE- AND OVERSHOOT BIT 1 (RPO1)
GAIN FM DEMODULATOR (AGN)
AUTO SWITCH OFF ENABLED (AUTO-OFF)
FORWARD: CH DOWN KEY
REVERSE: CH UP KEY
( ) means OSD display.

Figure B: ADJUSTMENT CATEGORIES

① Press the CH DOWN/UP key on the remote controller to get ready to select the mode one by one.
② Press the CH DOWN/UP key on the remote controller to select the modes reversibly one by one.
③ Using the VOLUME UP/DOWN key on the remote controller, the data can be modified.
(OSD distubance can be erased by R/C display key)

SERVICE MODE

SERVICE POSITION	ADJUST ITEM	DATA			REMARK
		RANGE	INITIAL VALUE	FIX/ADJ	
AGC	AGC TAKE OVER POINT	0~63	14	ADJ	
V-LIN	VERTICAL SLOPE	0~63	32	ADJ	
V-AMP	VERTICAL AMP	0~63	32	ADJ	
V-CENT	VERTICAL SHIFT	0~63	32	ADJ	
V-ZOOM	VERTICAL ZOOM	0~63	32	FIX	
H-CENT	HORIZONTAL SHIFT	0~63	32	ADJ	
H-SIZE	EAST-WEST WIDTH	0~63	32	FIX	
EW//	HORIZONTAL PARALLELOGRAM	0~63	32	FIX	
PARA	EAST-WEST PARABOLA / WIDTH	0~63	32	FIX	
COR(U)	EAST-WEST UPPER CORNER PARABOLA	0~63	32	FIX	
COR(L)	EAST-WEST LOWER CORNER PARABOLA	0~63	32	FIX	
TRAPE	EAST-WEST TRAPEZIUM	0~63	32	FIX	
HB	HORIZONTAL BOW	0~63	32	FIX	
S-COR	S-CORRECTION	0~63	0	FIX	20" - 17 / 21" - 20
DRI-R-HI	W.P. RED OFFSET HIGH / OFFSET BLUE TONE	0~63	32	FIX	must be "32"
DRI-G-HI	W.P. GREEN OFFSET HIGH / OFFSET BLUE TONE	0~63	32	FIX	must be "33"
DRI-B-HI	W.P. BLUE OFFSET HIGH / OFFSET BLUE TONE	0~63	32	FIX	must be "37"
DRI-R-MH	W.P. RED MH /STD	0~63	25	FIX	must be "32"
DRI-G-MH	W.P. GREEN MH / STD	0~63	32	ADJ	
DRI-B-MH	W.P. BLUE MH / STD	0~63	32	ADJ	
DRI-R-ML	W.P. RED OFFSET ML / OFFSET RED TONE	0~63	32	FIX	must be "32"
DRI-G-ML	W.P. GREEN OFFSET ML / OFFSET RED TONE	0~63	32	FIX	must be "32"
DRI-B-ML	W.P. BLUE OFFSET ML / OFFSET RED TONE	0~63	32	FIX	must be "25"
DRI-R-LO	W.P. RED OFFSET LOW	0~63	32	FIX	must be "32"
DRI-G-LO	W.P. GREEN OFFSET LOW	0~63	32	FIX	must be "22"
DRI-B-LO	W.P. BLUE OFFSET LOW	0~63	32	FIX	must be "19"
SUB-VOL	MAX VOLUME	0~63	63	FIX	must be "63"
SUB-CON	SUB CONTRAST	0~63	63	FIX	must be "54"
SUB-COL	SUB COLOR	0~63	32	ADJ	
SUB-BRI	SUB BRIGHTNESS	0~63	32	ADJ	
SUB-TINT	SUB TINT	0~63	32	ADJ	
SUB-SHP	SUB SHARPNESS	0~63	32	FIX	must be "27"
HTL-VOL	MAX HOTEL VOLUME	0~63	32	FIX	
HTL-PRG	HOTEL PROGRAM NO	0~125 or >125 for none	255	FIX	
BB-CON	BLUE BACK CONTRAST	0~15	10	FIX	must be "5"
RGB	OSD GRB REFERENCE	0~15	15	FIX	
CUT-R	BLACK LEVEL OFFSET R	0~63	32	ADJ	
CUT-G	BLACK LEVEL OFFSET G	0~63	32	ADJ	
CDL	CATHODE DRIVE LEVEL	0~15	0	FIX	must be "4"
DL-TV	Y-D TIME (TV) [YD]	0~15	12	FIX	must be "2"
DL-AV	Y-D TIME (AV) [YD]	0`15	12	FIX	must be "8"
INIT	INITIAL / DEFAULT LANGUAGE	0 (English), 1 (Spanish), 2 (French)	0	FIX	must be "0"
FAO-VOL	FAO-MAX VOLUME	0~63	63	FIX	must be "57"
ESV_OFFS	ENERGY SAVE OFFSET	0~63	10	FIX	must be "20"
CCPOS	CLOSE CAPTION POSITION	0~255	32	ADJ	
ATT	ATTENUATE INPUT SIGNAL LEVEL	0~15	10	FIX	
VCO	VCO FREE RUNNING FREQUENCY ADJ.	0~63	32	FIX	
FILTER	"STEREO, SAP, DBX FILTER ADJ."	0~63	28	FIX	
WIDEBAND	STEREO SEPARATION ADJUSTMENT (300HZ)	0~63	32	FIX	
SPECTRAL	STEREO SEPARATION ADJUSTMENT (3KHZ)	0~63	27	FIX	
BASS	BASS LEVEL	0A'15	8	FIX	
TREBLE	TREBLE LEVEL	0A'15	8	FIX	
VSD	VERTICAL SCAN DISABLE	0 or 1 when item selected	0	FIX	
BKS	BLACK STRETCH	0 (disable) or 1 (enable)	1	FIX	
AVL	AUTOMATIC VOLUME LEVELLING	0 (disable) or 1 (enable)	1	FIX	
FFI	FAST FILTER IF-PLL	0 (disable) or 1 (enable)	0	FIX	
EVG	ENABLE VERTICAL GUARD	0 (disable) or 1 (enable)	1	FIX	
EHT	EHT TRACKING MODE	0 (disable) or 1 (enable)	1	FIX	
OSO	OVERSCAN SWITCH OFF	0 (disable) or 1 (enable)	0	FIX	
ACL	AUTO COLOR LIMIT	0 (disable) or 1 (enable)	1	FIX	
FCO	FORCED COLOR-ON	0 (disable) or 1 (enable)	0	FIX	
VMI	VIDEO MUTE AT IDENT LOSS	0 (disable) or 1 (enable)	1	FIX	
VMC	VIDEO MUTE AT PROGRAM / SOURCE CHANGE	0 (disable) or 1 (enable)	1	FIX	
HTL	HOTEL MODE	0 (disable) or 1 (enable)	0	FIX	
BTSC	GAIN FM DEMODULATOR	0 (disable) or 1 (enable)	0	FIX	
CP	CHARGE PUMP	0 (fast tuning) or 1 (moderate speed tuning)	0	FIX	

Table - A

20/21V-L110M

SERVICE POSITION	ADJUST ITEM	DATA			REMARK
		RANGE	INITIAL VALUE	FIX/ADJ	
FMWS	FM WINDOW SELECTION	0 (disable) or 1 (enable)	0	FIX	
SM0	SOUND MUTE BIT 0 (SM0)	0 (disable) or 1 (enable)	1	FIX	
SM1	SOUND MUTE BIT 1	0 (disable) or 1 (enable)	0	FIX	
AGC0	IF AGC SPEED BIT 0	0 (disable) or 1 (enable)	1	FIX	
AGC1	IF AGC SPEED BIT 1	0 (disable) or 1 (enable)	0	FIX	
FOA-FE	PHI 1 TIME CONSTANT FOR FE	0 (disable) or 1 (enable)	0	FIX	
FOB-FE	PHI 1 TIME CONSTANT FOR FE	0 (disable) or 1 (enable)	0	FIX	
FOA-AV	PHI 1 TIME CONSTANT FOR AV	0 (disable) or 1 (enable)	1	FIX	
FOB-AV	PHI 1 TIME CONSTANT FOR AV	0 (disable) or 1 (enable)	1	FIX	
FSL	FORCED SLICING LEVEL FOR VERTICAL SYNC.	0 (disable) or 1 (enable)	0	FIX	
HP2	SYNCHRONIZATION OF OSD/TEXT DISPLAY	0 (disable) or 1 (enable)	0	FIX	
RGBL	RGB BLANK	0 (disable) or 1 (enable)	0	FIX	
V-CHIP	V-CHIP	0 (disable) or 1 (enable)	0	FIX	
MTS	MTS DECODING ENABLED	0 (disable) or 1 (enable)	0	FIX	
DEMO	DEMO MODE	0 (disable) or 1 (enable)	1	FIX	
CLOCK	REAL TIME CLOCK / ON TIMER	0 (disable) or 1 (enable)	0	FIX	
E-SAVE	ENERGY SAVE	0 (disable) or 1 (enable)	1	FIX	
P_PREF	PERSONAL PREFERENCE PROGRAM	0 (disable) or 1 (enable)	0	FIX	
UNIV+	UNIVERSAL PLUS	0 (disable) or 1 (enable)	0	FIX	
SPEAKER	SPEAKER ON/OFF	0 (disable) or 1 (enable)	0	FIX	
FAO	FIXED AUDIO OUT	0 (disable) or 1 (enable)	0	FIX	
VIEW-TM	VIEW TIMER	0 (disable) or 1 (enable)	1	FIX	must be "1"
FRENCH	FRENCH LANGUAGE	0 (disable) or 1 (enable)	1	FIX	
EZ-SETUP	EZ SETUP / AUTOPRESET	0 (AUTOPRESET) or 1 (EZ SETUP)	1	FIX	
W-TEMP	WHITE TEMP OR FAVORITE COLOR	0 (FC) or 1 (WT)	0	FIX	
AV	AV ENABLED OR DISABLED	0 (without ext. source) or 1 (with external source)	1	FIX	
AV2	AV2 ENABLED OR DISABLED	0 (1 input) or 1 (2 input)	0	FIX	
DSK	DYNAMIC SKIN CONTROL	0 (disable) or 1 (enable)	0	FIX	
RPO0	RATIO PRE- AND OVERSHOOT BIT 0	0 (disable) or 1 (enable)	0	FIX	
RPO1	RATIO PRE- AND OVERSHOOT BIT 1	0 (disable) or 1 (enable)	0	FIX	
AGN	GAIN FM DEMODULATOR	0 (normal) or 1 (+6dB)	0	FIX	
AUTO-OFF	AUTO SWITCH OFF ENABLED	0 (disable) or 1 (enable)	1	FIX	
PON-CH		0 (disable) or 1 (enable)	1	FIX	

Table - A

Holding down to short JA137 & JA138 and turn on the main power SW will automatically write the initial values into IC1003.
This can be done only when a new EEPROM is used. (Judge with the first 4 bytes.)

PART REPLACED	ADJUSTMENT		NOTES
	NECESSARY	UNNECESSARY	
IC801		X	Data is stored in IC1003
IC1003	X		Holding down to short JA137 & JA138 and turn on the main power SW will automatically write the initial values into IC1003. This can be done only when a new EEPROM is used. (Judge with the first 4 bytes.)
CRT	X		Adjust items related to picture tube only.

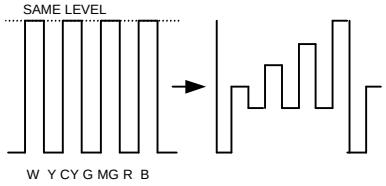
Table - B

■ SERVICE ADJUSTMENT

RF AGC Adjustment

1. Receive a good local channel.
2. Enter the service mode signal category and select the service adjustment "AGC".
3. Set the data value to point where no noise or beat appears.
4. Select another channel to confirm that no noise or beat appears.

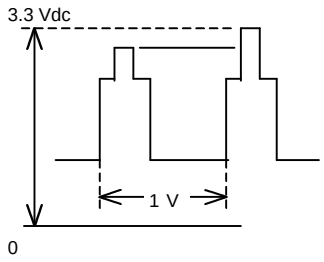
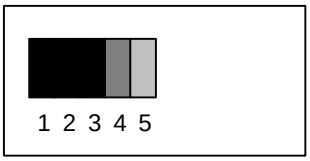
CHROMA ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**SUB-TINT (I^2C BUS CONTROL)**	1. Receive the "Color Bar" signal through AV in. 2. Connect the oscilloscope to TP47B (Pin (5) of P882) BLUE-OUT. ● Range : 10 V/div. (AC) (Use probe 10:1) ● Sweep time : 10 μsec/div. 3. Call the "SUB-TINT" mode in service mode. Adjust the "SUB-TINT" bus data to obtain the waveform shown as Fig 1. 4. "SUB-TINT" bus data decrease 4 steps to get final waveform. (Fig 2.) 5. Clear the SERVICE mode.	WAVEFORM 1 SAME LEVEL  W Y CY G MG R B Fig 1 Fig 2

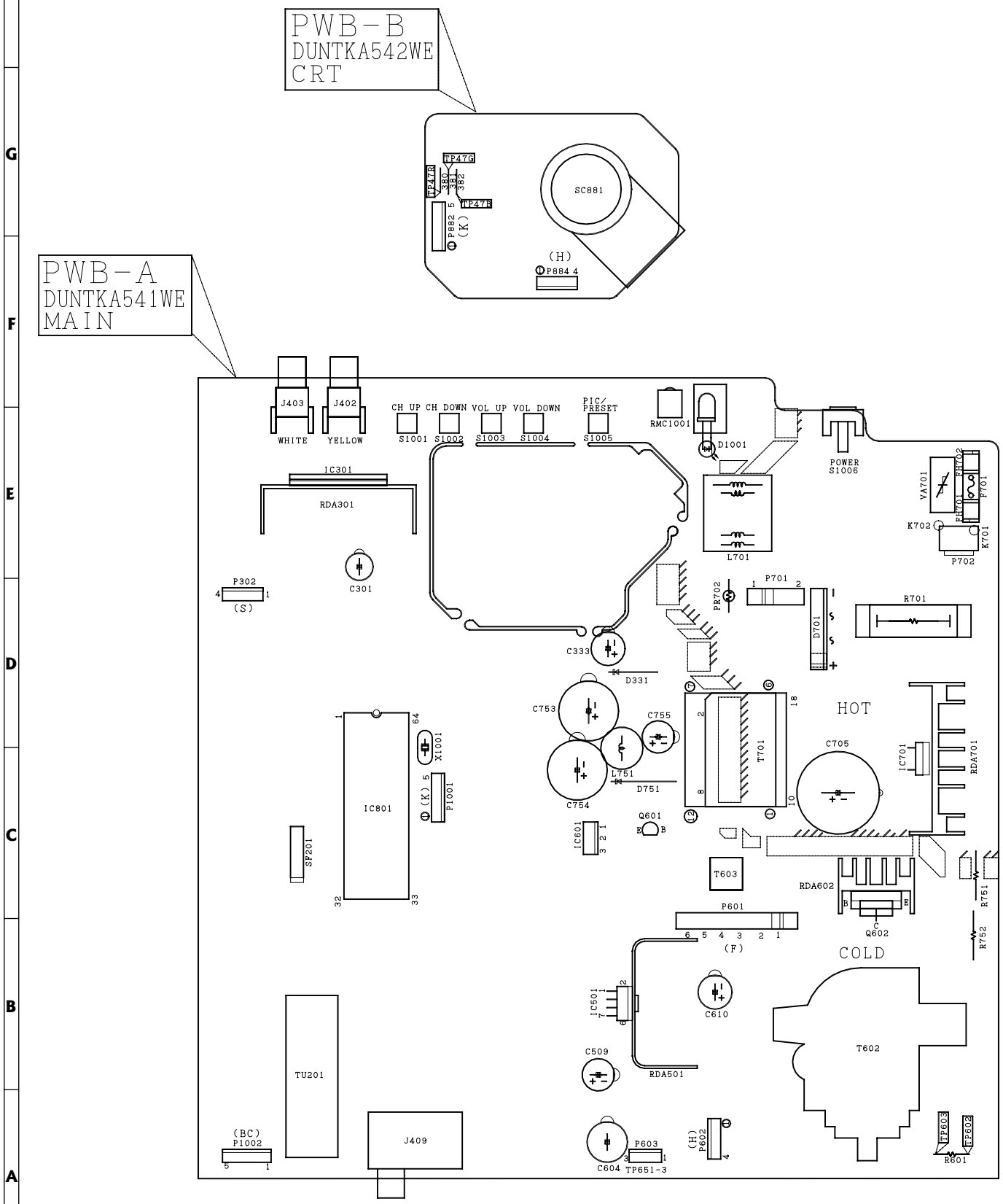
HORIZONTAL AND VERTICAL DEFLECTION LOOP ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**V-SLOPE (I^2C BUS CONTROL)**	1. Receive the Monoscope Pattern Signal. 2. Call the "V-LIN" mode. 3. Increase or decrease "V-LIN" by Volume key till the horizontal line in the center of monoscope is just at the position where the blanking starts.	
2	**V-CENTER (I^2C BUS CONTROL)**	1. Call the "V-CENT" mode. 2. Increase or decrease "V-CENT by Volume key till the picture is centered.	
3	**V-AMP (I^2C BUS CONTROL)**	1. Call the "V-AMP" mode. 2. Increase or decrease "V-AMP" by Volume key to set overscan to 10.0% typical. Adjustment Spec 10.0% range ± 1%	
4	**S-CORRECTION (I^2C BUS CONTROL)**	**FIXED DATA, NO NEED TO ADJUST.**	
5	**H-CENTER**	1. Call the "H-CENT" mode. 2. Increase or decrease "H-CENT" by Volume key to center the picture horizontal.	
6	**Focus Adjustment**	1. Receive the "Monoscope Pattern" signal. 2. Press the R/C to set Picture NORMAL condition. 3. Adjust the focus control to get the best focus.	

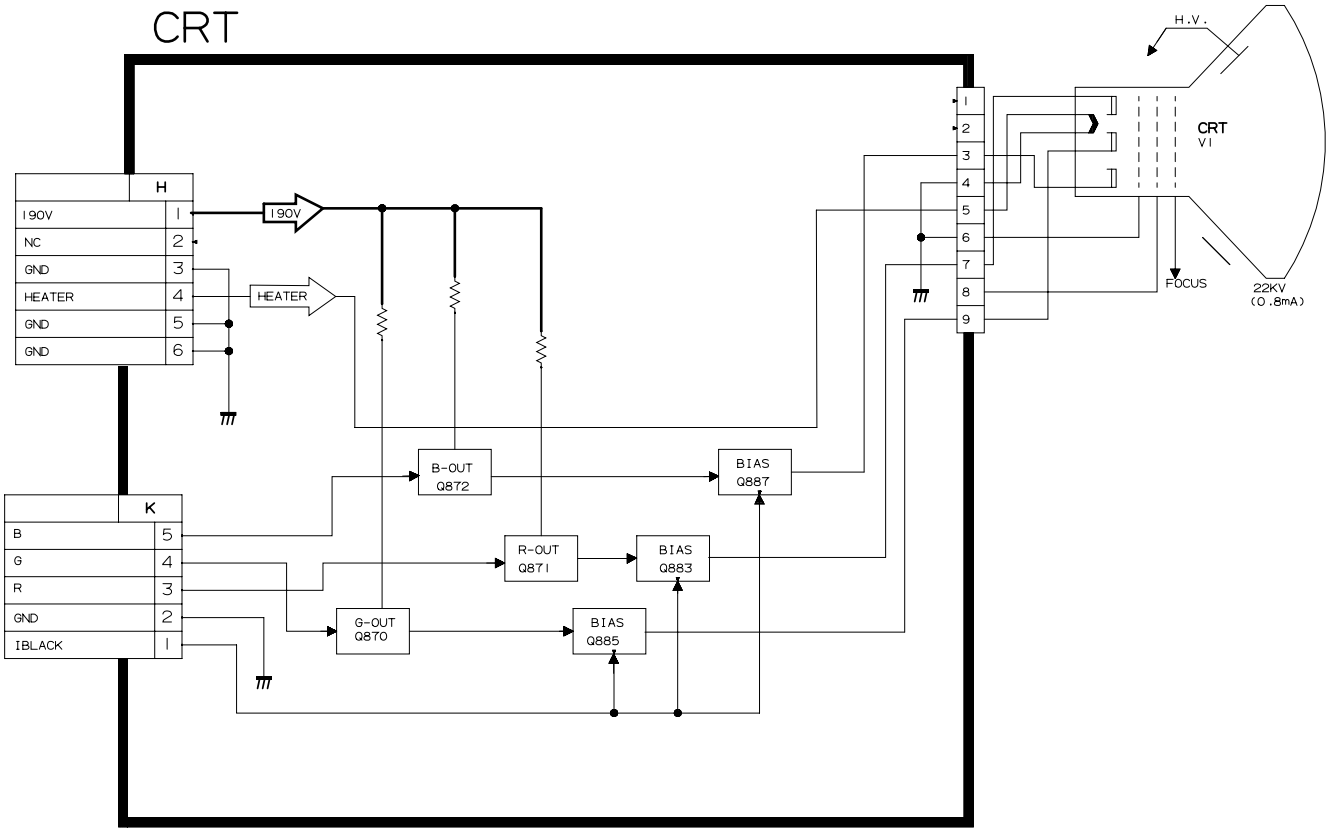
CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**CRT CUTOFF ADJUSTMENT (I2C BUS CONTROL)**	1. Switch TV to VIDEO mode, BLUE BACK OFF, with NO VIDEO signal. 2. Press R/C to set Picture Normal condition. 3. Connect the oscilloscope to Red OUT from IC801. (TP47R) Range : 1 V/Div (DC) Sweep : 5 msec/Div 4. Adjust SCREEN VR, so that the tip of signal reach 3.3 Vdc + 0.1 Vdc.	
2	**SUB-BRIGHT-NESS ADJUSTMENT (I2C BUS CONTROL)**	1. Call "SUB-BRI" in service mode. (Receive Cross-hatch pattern with 5 black level windows) 2. Adjust the "SUB BRIGHT" bus data in order that the line 1, 2 and 3 have the same darkness wherelse line 4 is slightly brighter than line 1, 2 and 3 and finally line 5 will be the brighter than line 4.	 1, 2, 3 are in same black level.
3	**WHITE BAL-ANCE SERVICE MODE ADJ. (I2C BUS CONTROL)**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC milliammeter between the TP602 (-) TP603 (+). 4. Check Beam current should be around (990μA) 5. Set it to service mode and adjust the DRI-G-MH, & DRI-B-MH data to have a color temperature of 11,600°K (white). 6. Receive "WHITE" pattern, WITH BURST signal, and set BRIGHTNESS Y by generator, to ** 10 cd/m^2 (MINOLTA CA-100) by reducing LUMINATE Y signal. 7. Adjust "CUT-R" & "CUT-G" to get 11,600°K. Then go back NORMAL mode (HIGH BRIGHT**) to check color temperature. If out of range, back to (1). **Note: This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 500mA.** DRI-R-MH=32 (FIXED) DRI-G-MH=33 (FIXED) DRI-B-MH=37 (FIXED) DRI-R-MH=32 (FIXED)	# 11,600°K X: 0.262 Y: 0.272 (MINOLTA COLOR ANALYZER CA-100) *NOTE: Above DATA can be UP/ DOWN by volume key. LOW HIGH 1.8cd/m2 115cd/m2 *11,600°K DRI-GW="DRI-GS"DATA-5 DRI-BW=:DRI-BS"DATA-5
4	**Maximum beam check**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC milliammeter between TP603 (+) and TP602 (-). (Full Scale: 3 mA Range) 4. Beam current must be within 990 ± 50 μA.	

MODEL 20/21V-L110M CHASSIS LAYOUT



BLOCK DIAGRAM



MODEL 20/21V-L110M BLOCK DIAGRAM

MAIN

IC301 S-OUT
STAND-BY
L-OUT VCC (+)
L-OUT GND (-)
L-IN GND
N.C
VOLUME
S-MUTE

SP301
SP302

IC1003
2K EEPROM
VSS A2 A1 A0
SDA SCL TEST VDD

RMC1001
GND VCC OUT

TO CRT UNIT K
IBLACK 1
GND 2
R 3
G 4
B 5

D1001

PICTURE/ PRESET
VOL DOWN
VOL UP
CH DOWN
CH UP

FOR ADJ BC
GND 5
SCL 4
SDA 3
EX BUS 2
BUS ACK 1

SPOT KILLER Q801
BUFFER Q802
3.3V
8V

X1001 12MHz

IC801 UOC
RC-IN SDA (EEP) SCL (EEP) VDDP 3.3V RESET X-OUT X-IN OSC VDDC 3.3V VPE GND VDDA 3.3V B-OUT G-OUT R-OUT IBLACK BCL B2-IN G2-IN R2-IN BLK2 AUDIO OUT C-IN EXT CBVS-IN GND1 INT CBVS-IN VPI 8V IF-VIDEO OUT PLL IF EHT EXT AUD-IN FB-IN SC-OUT H-DR OUT
POW SCL SDA S-VOL EXIT AV S-MUTE KEY-IN PROT IN GND VSSC-P POW LED ST LED GND VSSA SECAM PLL 8V VP2 DEC D10 PHOLF PHILF GND3 DEC B0 AVL VDRB VDRA IF-IN1 IF-IN2 VSC VER IREF RF-AGC OUT I-OUT AUDIO DEEM DEC S-DEM GND2 SPLL SW T AV1 AV2 OTHER REOUT

RC-IN
SDA(EEP)
SCL(EEP)
LB
G
LR
BL
R-GUARD
S-OUT
EXT - VIDEO
CVBS
8V
IF VIDEO
EXT - AUDIO
H-DR OUT

POW
SCL
SDA
S-VOL
EX BUS
S-MUTE
KEY-IN
PRO
8V
VDRB
VDRA
RF AGC

SOUND CARRIER FILTER 4.5MHZ
CVBS

H-DRIVE Q601A T601
H-OUT Q602

IC501 V-OUT
VDRB VCC RAMP UP -VCC OUT OUT VCC VDRA

IF1
IF2
SF201 SAW FILTER

TU201 TUNER
IF
BT
LB
HB
SDA
SCL
ADR
AGC
IF PRE-AMP Q201
33V
33V REG D201
190V
5V
SDA
SCL
AGC
TP201

J409 REAR AV-JACK
AUDIO VIDEO

J403 J402
FRONT AV
AUDIO VIDEO

Q752 3.3V REG
3.3V GND IN
3.3V

Q751 5V REG
5V
8V

ST_7.5V
130V

T701 SWITCHING TRANSFORMER

IC701 SWITCHING REGULATOR
OCP/FB
S
D
IN
GND

AC CORD
A1
A2
F701 FUSE
L701 LINE FILTER
M1
M2
ADG COIL
D701 BRIDGE DIODE

CAPRISTOR R751 R752 C751

V-OUT

F TO DY
6
5
4
3
2
1

H-OUT

T602 FBT
HV
FOCUS
G2
2V VP

PRO
Q603 PROTECTOR

IC601 8V REG
8V

190V

H TO CRT UNIT
1 +190V
2 NC
3 GND
4 HEATER

TP603 TP602
ABL

DESCRIPTION OF SCHEMATIC DIAGRAM

NOTES:

1. *The unit of resistance "ohm" is omitted. (K=k =1000 , M=M)*
2. *All resistors are 1/16 watt, unless otherwise noted.*
3. *All capacitors are μF, unless otherwise noted. (P=pF=μμF)*
4. *(G) indicates ±2% tolerance may be used.*
5. ⏚ *indicates line isolated ground.*
6. ⏚ *indicates hot ground.*

VOLTAGE MEASUREMENT CONDITIONS:

1. *All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.*
2. *All voltages measured with 1000μ V B &W or Color signal.*

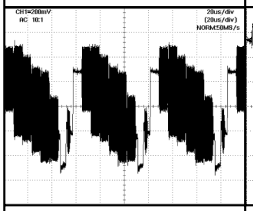
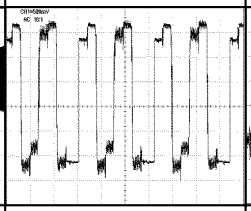
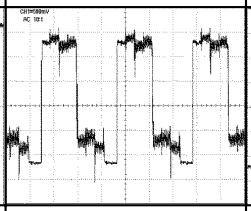
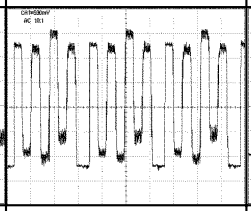
WAVEFORM MEASUREMENT CONDITIONS:

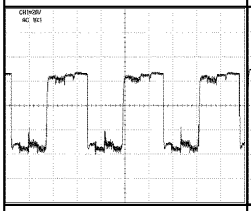
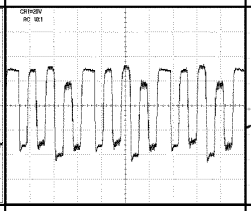
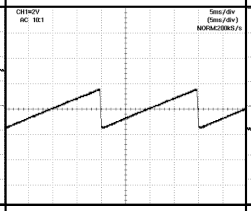
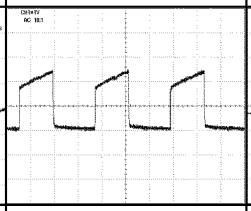
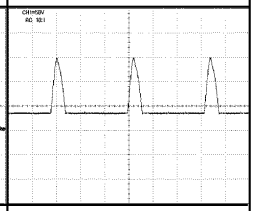
1. *Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.*
2. ◯➤ *indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)*

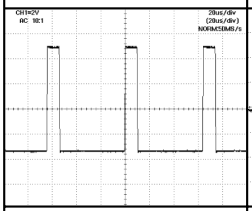
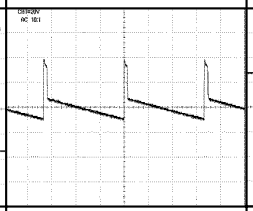
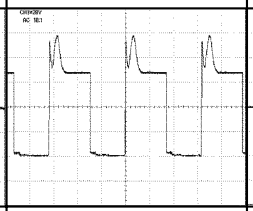
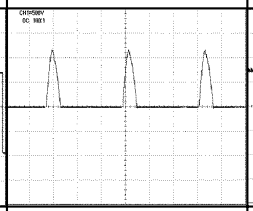
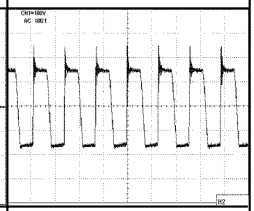
□□ *AND SHADED ( ) COMPONENTS =SAFETY RELATED PARTS.*
□ *MARK=X-RAY RELATED PARTS.*

This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

WAVEFORMS

□□ 1.0 Vp-p	□□ 2.8 Vp-p	□□ 2.6 Vp-p	□□ 2.7 Vp-p	□□ 65.0 Vp-p
				
Horiz. Rate	Horiz. Rate	Horiz. Rate	Horiz. Rate	Horiz. Rate

□ 67.0 Vp-p	□□ 80.0 Vp-p	□□ 3.0 Vp-p	□□ 2.3 Vp-p	□□ 116.0 Vp-p
				
Horiz. Rate	Horiz. Rate	Vert. Rate	Horiz. Rate	Horiz. Rate

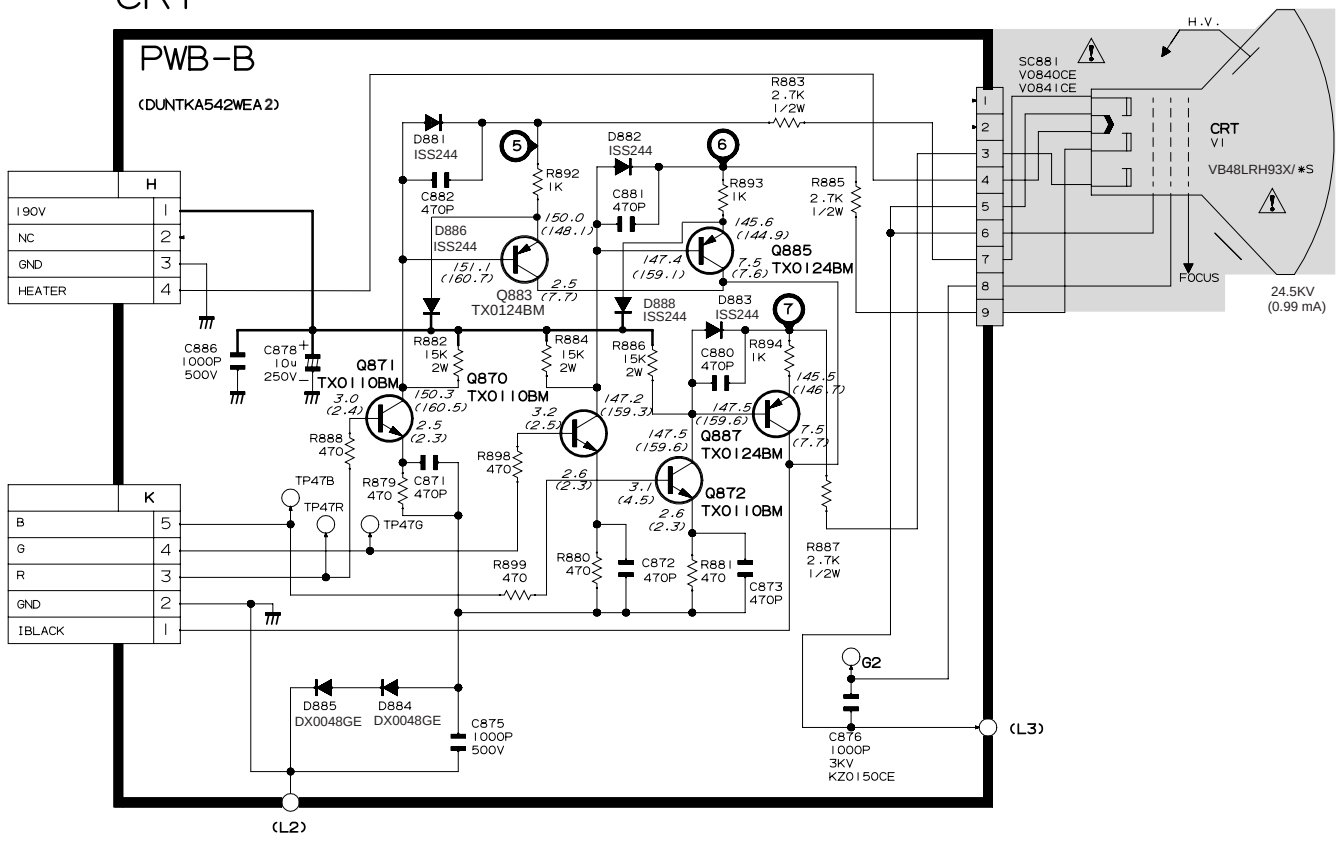
□□ 8.4 Vp-p	□□ 40.8 Vp-p	□□ 98.0 Vp-p	□ 1,160 Vp-p	□□ 415.0 Vp-p
				
Horiz. Rate	Vert. Rate	Horiz. Rate	Horiz. Rate	Power Supply Rate

SCHEMATIC DIAGRAM: CRT Unit

NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED (K=1000 OHMS, M=MEGAOHM).
2.ALL RESISTORS ARE 1/16 WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL (u, P, ETC).

20V-L110M

CRT

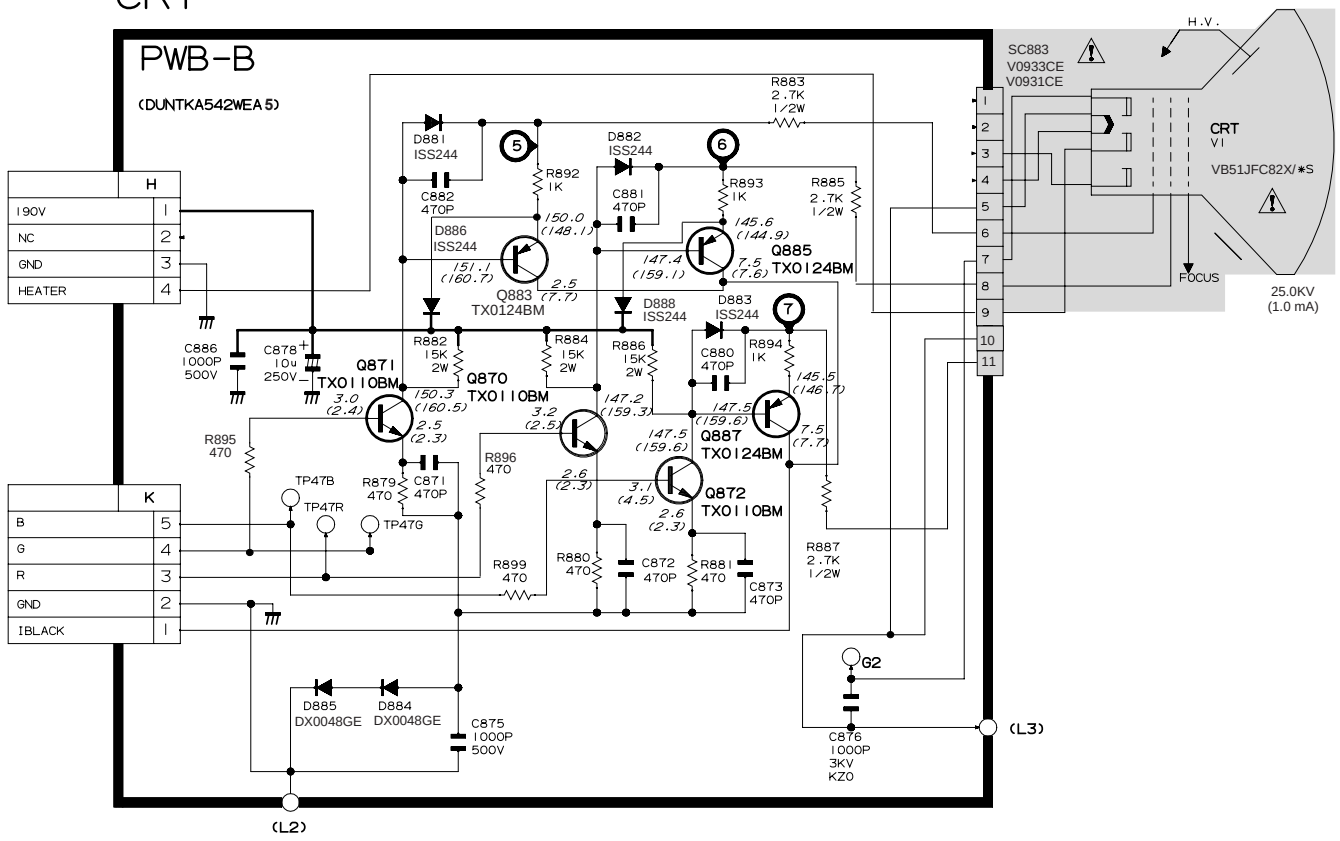


SCHEMATIC DIAGRAM: CRT Unit

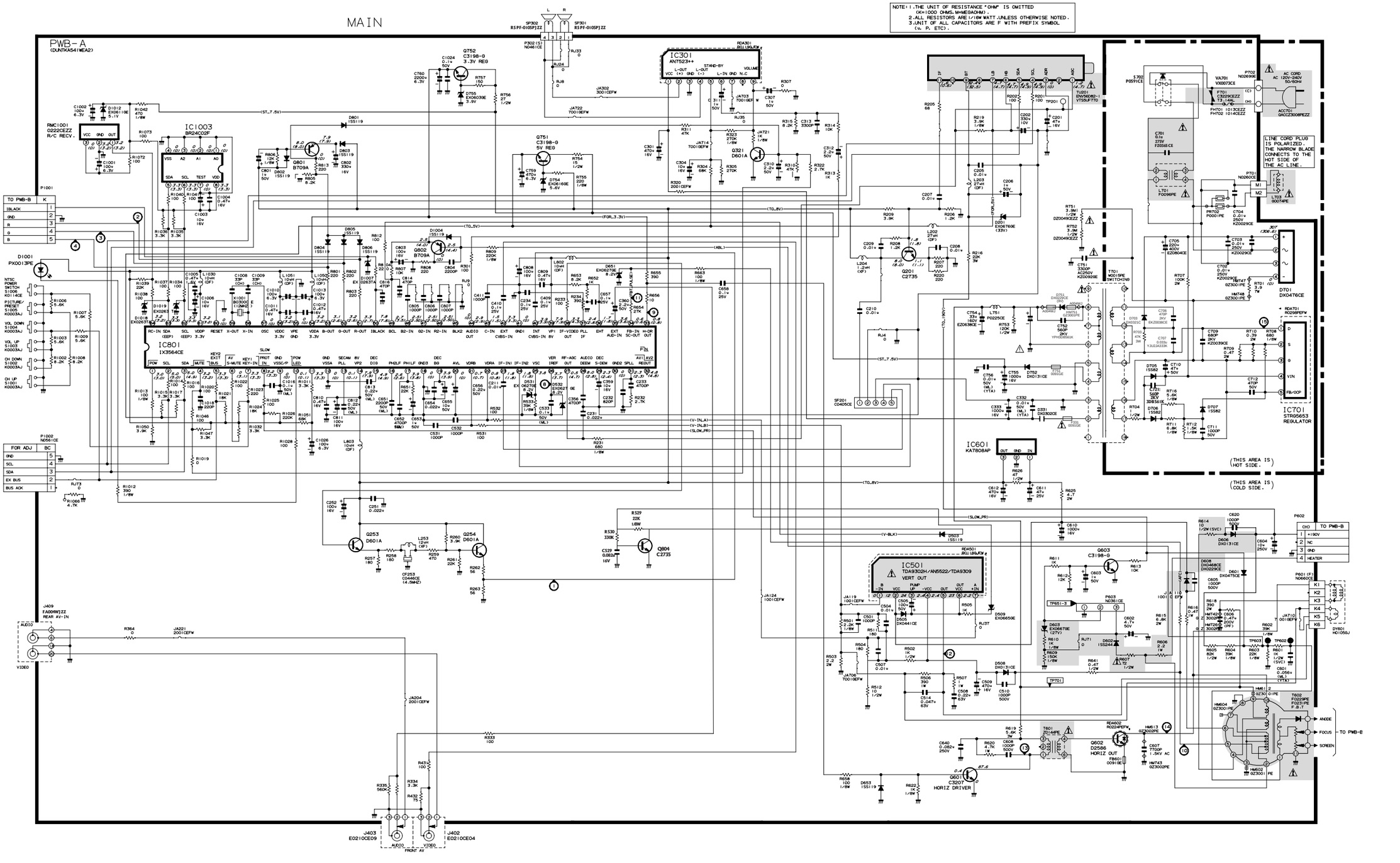
NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED (K=1000 OHMS, M=MEGAOHM).
2.ALL RESISTORS ARE 1/16 WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL (u, P, ETC).

21V-L110M

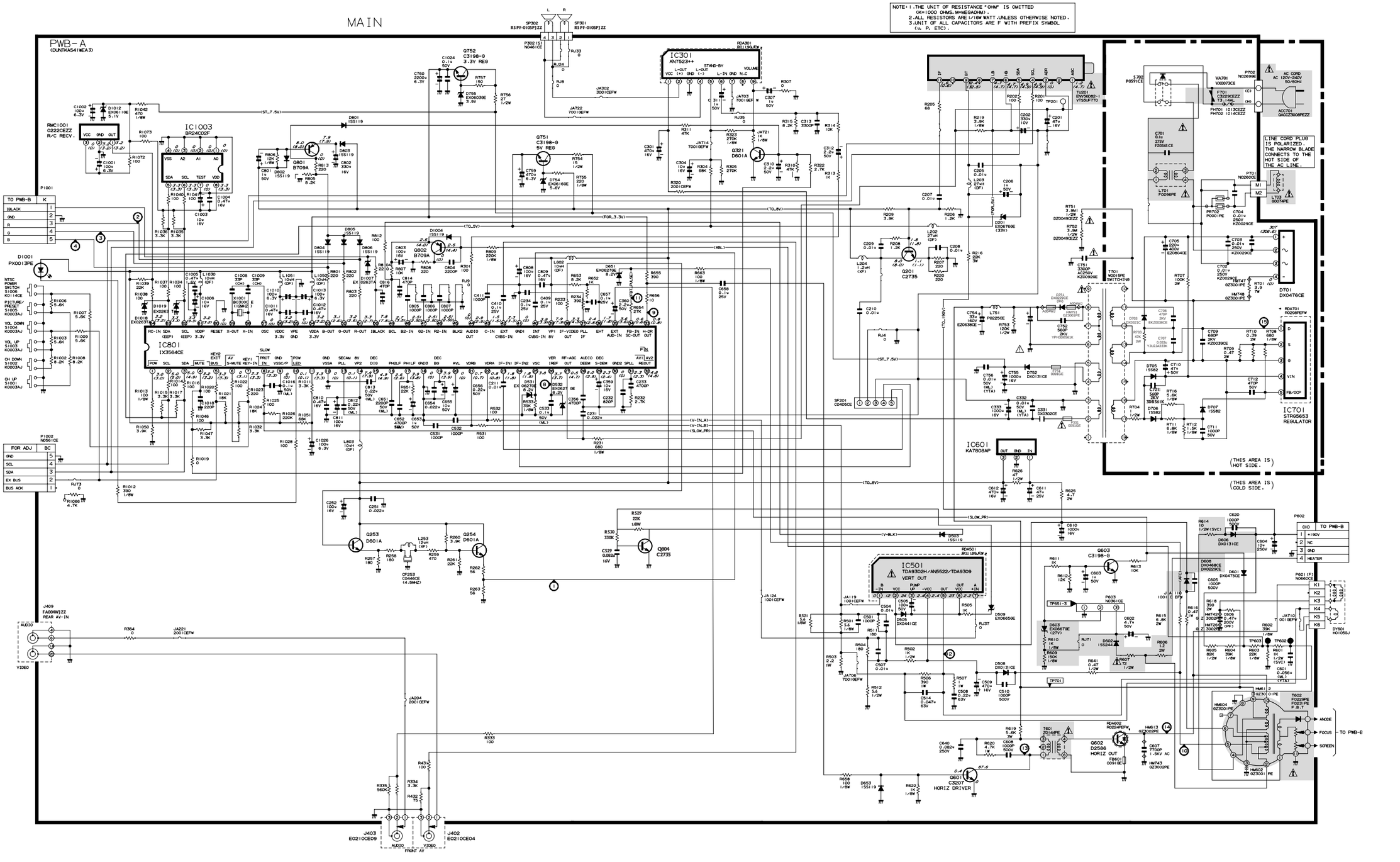
CRT



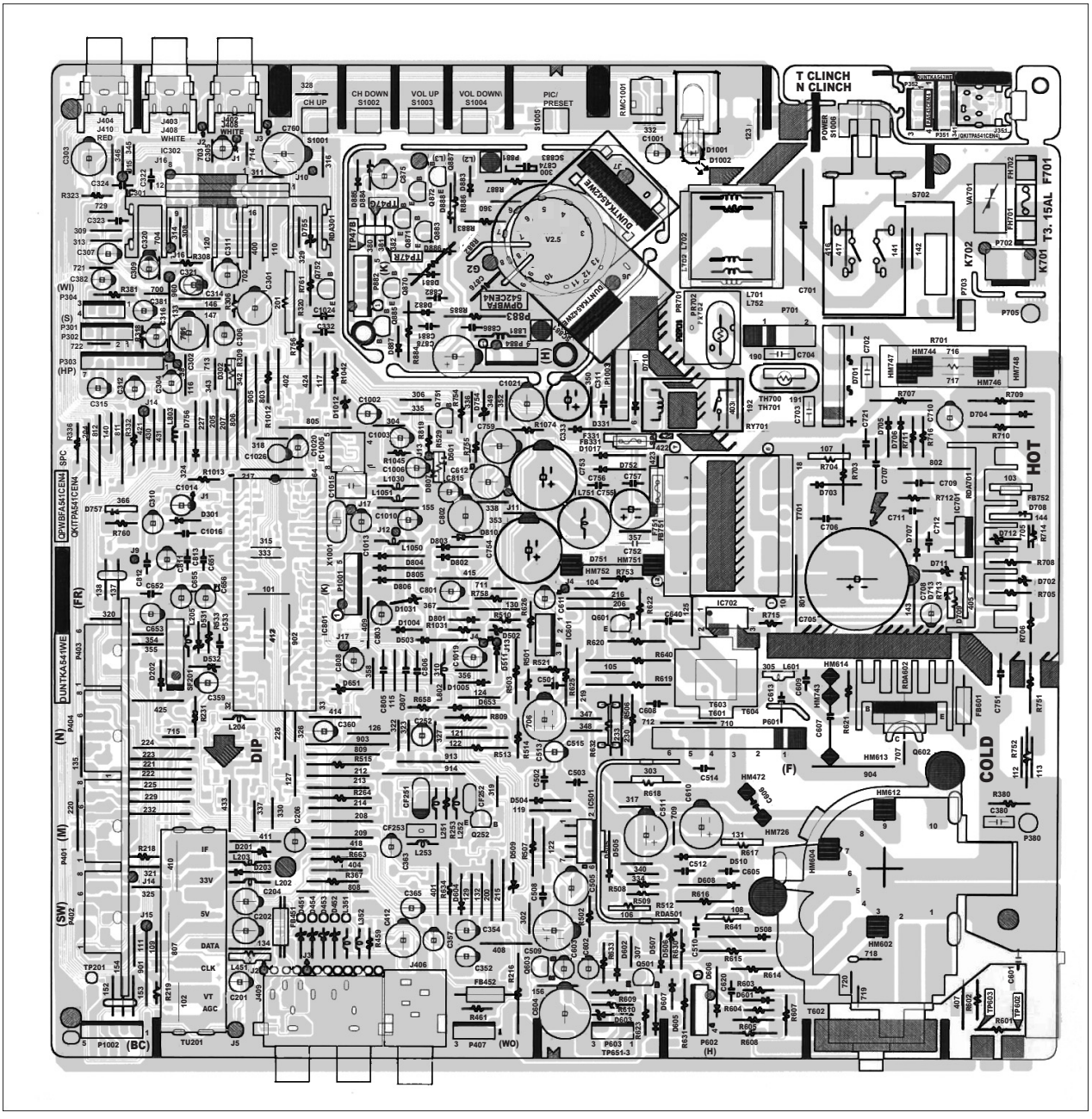
MODEL 20V-L110M SCHEMATIC DIAGRAM: MAIN Unit



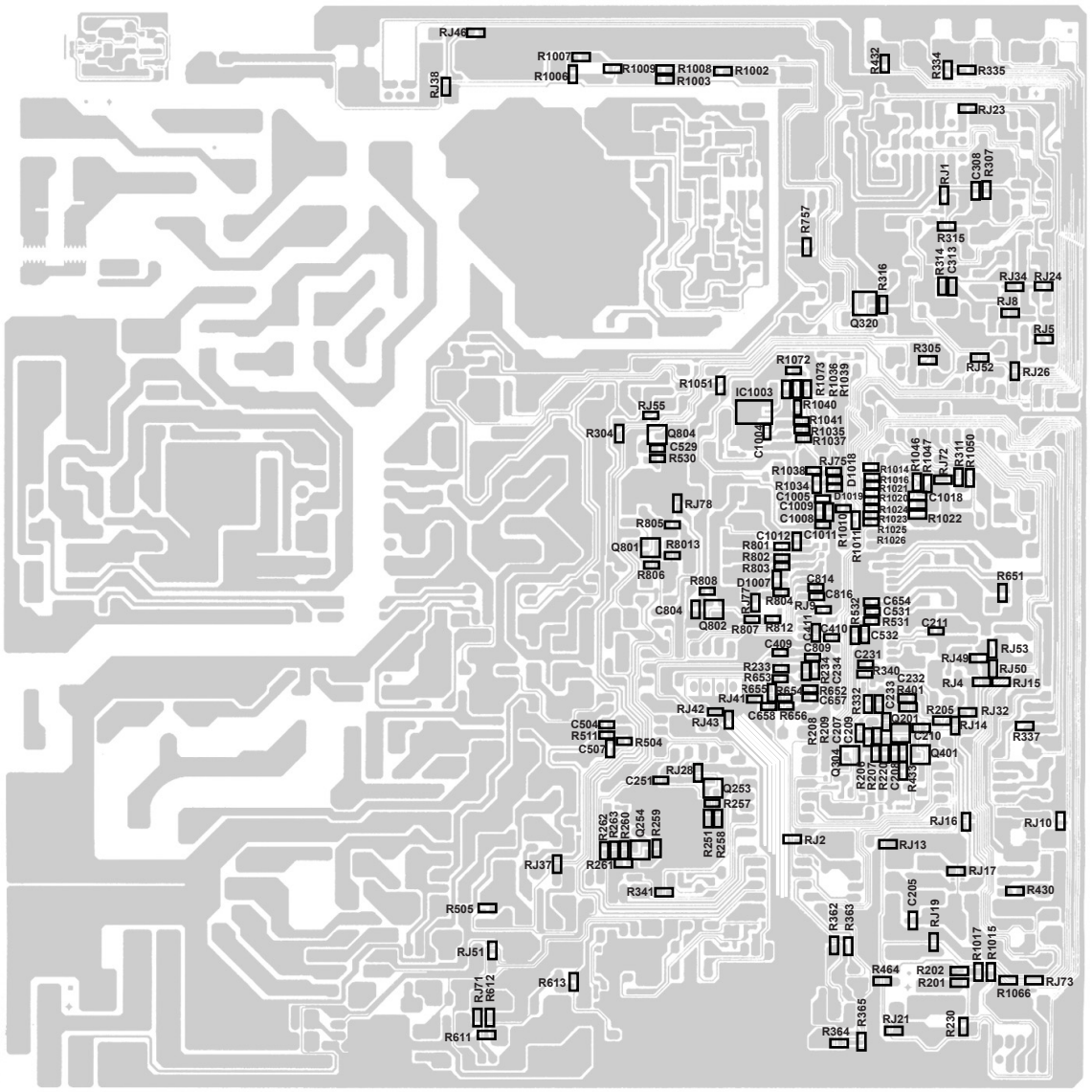
MODEL 21V-L110M SCHEMATIC DIAGRAM: MAIN Unit



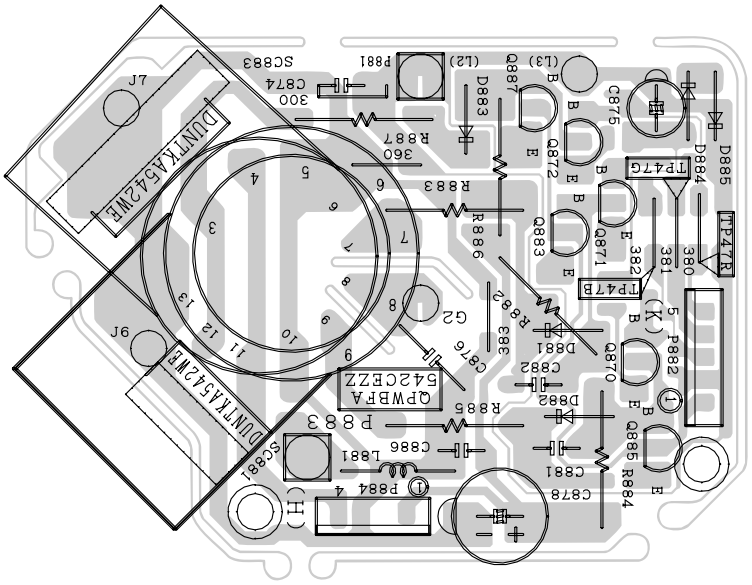
PRINTED WIRING BOARD ASSEMBLIES



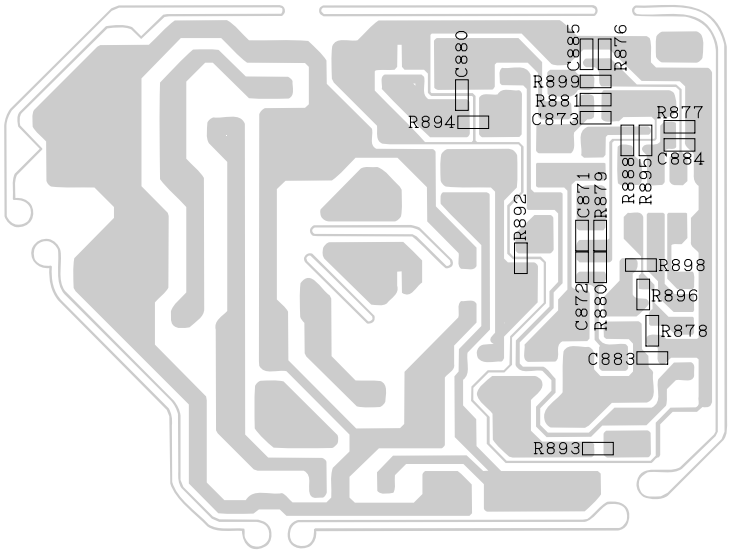
PWB-A: MAIN Unit (Wiring Side)



PWB-A: MAIN Unit (Chip Parts Side)



PWB-B: CRT Unit (Wiring Side)



PWB-B: CRT Unit (Chip Parts Side)

REPLACEMENT PARTS LIST

Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by ⚠ And shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristic as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

▲ MARK: X-RAY RELATED PARTS

Ref. No.	Part No.	Description
	PICTURE TUBE	
⚠V1	VB48LRH93X/*S	Picture Tube (20V-L110M)
⚠V1	VB51JFC82X/*S	Picture Tube (21V-L110M)
⚠L703	RCILG0074PEZZ	Degaussing Coil (20V-L110M)
⚠L703	RCILG0106PJZZ	Degaussing Coil (21V-L110M)
⚠DY601	RCILHA008WJZZ	Deflection Yoke (20V-L110M)
⚠DY601	RCILHA009WJZZ	Deflection Yoke (21V-L110M)
	LHLDW1633PJZZ	Wire Holder, x5
	PMAGF3006CEZZ	Purity Magnet (20V-L110M)
	PMAGF3045CEZZ	Purity Magnet (21V-L110M)
	QEARC2016PEZZ	CRT Ground Wire (20V-L110M)
	EWBC-L640WEV5	CRT Ground Wire (21V-L110M)
	PSPAG0017PEZZ	Wedge, x3

PRINTED WIRING BOARD ASSEMBLIES
(NOT REPLACEMENT ITEM)

PWB-A	DUNTKA541WEB3	MAIN Unit
PWB-B	DUNTKA542WEA2	CRT Unit

Ref. No.	Part No.	Description
	PWB-A: DUNTKA541WEB3 MAIN UNIT	
	TUNER	
	NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.	
⚠TU201	VTUENV56D82-1	Tuner
	INTEGRATED CIRCUITS	
IC1003	VHIBR24C02F1E	BR24C02F-W
IC301	VHIAN7523++-1	AN7523++
⚠IC501	VHITDA9302H-1	TDA9302H
IC601	VHIKA7808AP-1	KA7808API
⚠IC701	VHISTRG5653-1	STRG5653
IC801	RH-IX3564CEN2	IX3564CE
	TRANSISTORS	
Q201	VS2SC2735//1E	2SC2735
Q253	VS2SD601A//-1	2SD601A
Q254	VS2SD601A//-1	2SD601A
Q321	VS2SD601A//-1	2SD601A
Q601	VS2SC3207//-1	2SC3207
Q602	VS2SD2586//1E	2SD2586
Q603	VS2SC3198-G-1	2SC3198-G
Q751	VS2SC3198-G-1	2SC3198-G
Q752	VS2SC3198-G-1	2SC3198-G
Q801	VS2SB709A//-1	2SB709A
Q802	VS2SB709A//-1	2SB709A
Q804	VS2SC2735//1E	2SC2735
	DIODES	
D201	RH-EX0676GEZZ	Zener Diode, 33V
⚠D331	RH-DX0302CEZZ	Diode
D503	VHD1SS119//-1	Diode
D505	RH-DX0441CEZZ	Diode
D508	RH-DX0131CEZZ	Diode
D509	RH-EX0627GEZZ	Zener Diode, 8.2V
D531	RH-EX0627GEZZ	Zener Diode, 8.2V
D532	RH-EX0627GEZZ	Zener Diode, 8.2V
D601	RH-DX0475CEZZ	Diode
⚠D602	VHD1SS244//-1	Diode
⚠D603	RH-EX0667GEZZ	Zener Diode, 27V
⚠D606	RH-DX0131CEZZ	Diode
⚠D608	RH-DX0468CEZZ	Diode
D651	RH-EX0627GEZZ	Zener Diode, 8.2V
D653	VHD1SS119//-1	Diode
D701	RH-DX0476CEZZ	Diode
D703	RH-DX0321CEZZ	Diode
D705	VHD1SS82///1A	Diode
D706	VHD1SS82///1A	Diode
D707	VHD1SS82///1A	Diode
⚠D751	RH-DX0229CEZZ	Diode
⚠D752	RH-DX0131CEZZ	Diode

Ref. No.	Part No.	Description
PWB-A: DUNTKA541WEB3 MAIN UNIT (Continued)		
D754	RH-EX0616GEZZ	Zener Diode, 5.6V
D755	RH-EX0603GEZZ	Zener Diode, 3.9V
D801	VHD1SS119//-1	Diode
D803	VHD1SS119//-1	Diode
D804	VHD1SS119//-1	Diode
D805	VHD1SS119//-1	Diode
D806	VHD1SS119//-1	Diode
D810	RH-DX0048GEZZ	Diode
D1001	RH-PX0013PEZZ	LED
D1004	RH-DX0048GEZZ	Diode
D1007	RH-EX0263TAZZ	Zener Diode
D1012	RH-EX0611GEZZ	Zener Diode
D1018	RH-EX0263TAZZ	Zener Diode
D1019	RH-EX0263TAZZ	Zener Diode
D1031	RH-EX0610GEZZ	Zener Diode
⚠ VA701	RH-VX0073CEZZ	Varistor
PACKAGED CIRCUITS		
PR702	RMPTP0001PEZZ	Packaged Circuit
X1001	RCRSB0300CEZZ	Crystal
FILTERS AND COILS		
CF253	RFILC0446CEZZ	Ceramic Filter
L202	VP-DF270K0000	Peaking 27 µH
L203	VP-DF270K0000	Peaking 27 µH
L204	VP-XF1R2K0000	Peaking 1.2 µH
L253	VP-XF120K0000	Peaking 12 µH
⚠ L701	RCILF0096PEZZ	Coil
⚠ L751	RCILP0225CEZZ	Coil
L802	VP-DF100K0000	Peaking 10 µH
L803	VP-DF100K0000	Peaking 10 µH
L1030	VP-DF100K0000	Peaking 10 µH
L1050	VP-DF100K0000	Peaking 10 µH
L1051	VP-DF100K0000	Peaking 10 µH
SF201	RFILC0405CEZZ	S.A.W. Filter
TRANSFORMERS		
⚠ T601	RTRNZ0144PEZZ	Transformer
⚠ T602	RTRNF0229PEZZ	H-Volt Transformer
⚠ T701	RTRNW0015PEZZ	Transformer
CAPACITORS		
[EL. …Electrolytic, M-Poly. …Metalized Polypro Film]		
C201	VCEA0A1CW476M	47, 16V EL.
C202	VCEA0A1AW337M	330, 10V EL.
C205	VCKYCY1HF103Z	0.01, 50V Ceramic
C206	VCEA0A1HW105M	1.0, 50V EL.
C207	VCKYCY1HB103K	0.01, 50V Ceramic
C208	VCKYCY1HB103K	0.01, 50V Ceramic
C209	VCKYCY1HB103K	0.01, 50V Ceramic
C210	VCKYCY1HF103Z	0.01, 50V Ceramic
C211	VCKYCY1HF103Z	0.01, 50V Ceramic
C231	VCKYCY1HF223Z	0.022, 50V Ceramic
C232	VCKYCY1HB821K	820p,50V Ceramic
C233	VCKYCY1HB472K	4700p,50V Ceramic
C234	VCKYCY1EF104Z	0.1, 25V Ceramic
C251	VCKYCY1HF223Z	0.022, 50V Ceramic
C252	VCEA0A1CW107M	100, 16V EL.
C301	VCEA0A1CW477M	470, 16V EL.
C304	VCEA0A1CW106M	10, 16V EL.
C307	VCEA0A1HW105M	1.0, 50V EL.
C310	VCEA0A1HW225M	2.2, 50V EL.
C311	VCEA0A1HW105M	1.0, 50V EL.
C312	VCEA0A1HW225M	2.2, 50V EL.
C314	VCEAKA1HW224M	0.22, 50V EL.
⚠ C332	VCQYTA1HM103J	0.01, 50V Mylar
C356	VCKYCY1HB472K	4700p,50V Ceramic
C359	VCEA0A1CW106M	10, 16V EL.
C360	VCEA0A1HW225M	2.2, 50V EL.
C409	VCKYCY1EF104Z	0.1, 25V Ceramic
C410	VCKYCY1EF104Z	0.1, 25V Ceramic
C411	VCKYCY1HB102K	1000p,50V Ceramic
C501	VCKYPA1HB102K	1000p,50V Ceramic
C504	VCKYCY1HB103K	0.01, 50V Ceramic
C505	VCEA0A1HW107M	100, 50V EL.
C507	VCKYCY1HB103K	0.01, 50V Ceramic
C508	VCFYSA1JB224J	0.22, 63V Mylar
C509	VCEA0A1CW477M	470, 16V EL.
C510	VCKYPA2HB102K	1000p,500V Ceramic
C514	VCFYSA1JB473J	0.047, 63V Mylar
C531	VCKYCY1HB102K	1000p,50V Ceramic
C532	VCKYCY1HB102K	1000p,50V Ceramic
C533	VCQYTA1HM104J	0.1, 50V Mylar
C601	VCQYTA1HM563J	0.056, 50V Mylar
C602	VCEA0A1HW475M	4.7, 50V EL.
C603	VCEA0A1HW105M	1.0, 50V EL.
C604	VCEA0A2EW106M	10, 250V EL.
C605	VCKYPA2HB102K	1000p,500V Ceramic
C606	VCFPVC2DB474J	0.47, 200V M-Poly.
C607	VCFPVC3ZA772H	7700p,1.5kV M-Poly.
C608	VCKYPA2HB102K	1000p,500V Ceramic
C610	VCEA0A1CW108M	1000, 16V EL.
C611	VCEA0A1EW476M	47, 25V EL.
C612	VCEA0A1CW477M	470, 16V EL.
C620	VCKYPA2HB102K	1000p,500V Ceramic
C640	VCFYSB2EB823J	0.082, 250V AD
C651	VCQYTA1HM222J	2200p, 50V Mylar
C652	VCQYTA1HM472J	4700p, 50V Mylar
C653	VCEA0A1HW105M	1.0, 50V EL.
C654	VCKYCY1HF223Z	0.022, 50V Ceramic
C655	VCEA0A1HW106M	10, 50V EL.
C656	VCEA0A1HW224M	0.22, 50V EL.
C657	VCKYCY1EF104Z	0.1, 25V Ceramic
C658	VCKYCY1EF104Z	0.1, 25V Ceramic
⚠ C701	RC-FZ036SCEZZ	0.1, 275V Plastic
C702	RC-KZ0029CEZZ	0.01, 250V Ceramic
C703	RC-KZ0029CEZZ	0.01, 250V Ceramic
C704	RC-KZ0029CEZZ	0.01, 250V Ceramic
C705	RC-EZ0804CEZZ	220, 400V EL.
C706	RC-KZ0038CEZZ	470p,2000V Ceramic

Ref. No.	Part No.	Description
PWB-A: DUNTKA541WEB3 MAIN UNIT (Continued)		
C707	VCFYJU2JA333K	0.033µ, 630V Mylar
C709	RC-KZ0039CEZZ	680, 2kV Ceramic
C710	VCEA0A1HW476M	47, 50V EL.
C711	VCKYPA1HB102K	1000p,50V Ceramic
C712	VCKYPA1HB471K	470p, 50V Ceramic
⚠ C721	VCKYPH3DB561K	560p,2000V Ceramic
⚠ C751	RC-KZ0092GEZZ	3300p,AC250V Ceramic
⚠ C752	VCKYPH3DB561K	560p,2000V Ceramic
⚠ C753	RC-EZ0724CEZZ	100, 16V EL.
⚠ C754	RC-EZ0724CEZZ	100, 16V EL.
⚠ C755	VCEA0A1CW108M	1000, 16V EL.
⚠ C756	VCQYTA1HM103J	0.01, 50V Mylar
C759	VCEA0A0JW477M	470, 6.3V EL.
C760	VCEA0A0JW228M	2200, 6.3V EL.
C801	VCEA0A1HW105M	1.0, 50V EL.
C802	VCEA0A1CW337M	330, 16V EL.
C803	VCEA0A1CW107M	100, 16V EL.
C804	VCKYCY1HB222K	2200p,50V Ceramic
C805	VCKYD41HB102K	1000p,50V Ceramic
C806	VCKYD41HB102K	1000p,50V Ceramic
C807	VCKYD41HB102K	1000p,50V Ceramic
C808	VCEA0A1CW107M	100, 16V EL.
C809	VCKYCY1CF474Z	0.47, 16V Ceramic
C810	VCKYCY1CF474Z	0.47, 16V Ceramic
C811	VCEA0A1CW107M	100, 16V EL.
C812	VCFYFA1HA224J	0.22, 50V Mylar
C813	VCFYFA1HA224J	0.22, 50V Mylar
C814	VCKYCY1HB471K	470p, 50V Ceramic
C816	VCKYCY1HB471K	470p, 50V Ceramic
C1001	VCEA0A0JW107M	100, 6.3V EL.
C1002	VCEA0A0JW107M	100, 6.3V EL.
C1003	VCEA0A1CW106M	10, 16V EL.
C1004	VCKYCY1CF474Z	0.47, 16V Ceramic
C1005	VCKYCY1CF474Z	0.47, 16V Ceramic
C1006	VCEA0A1CW106M	10, 16V EL.
C1008	VCCCCY1HH330J	33p, 50V Ceramic
C1009	VCCCCY1HH330J	33p, 50V Ceramic
C1010	VCEA0A0JW107M	100, 6.3V EL.
C1011	VCKYCY1CF474Z	0.47, 16V Ceramic
C1012	VCKYCY1CF474Z	0.47, 16V Ceramic
C1013	VCEA0A0JW107M	100, 6.3V EL.
C1016	VCQYTA1HM104J	0.1, 50V Mylar
C1018	VCKYCY1HB221K	220p, 50V Ceramic
C1024	VCQYTA1HM104J	0.1, 50V Mylar
C1026	VCEA0A0JW107M	100, 6.3V EL.
RESISTORS		
[M-Ox. …Metal Oxide, M-Film …Metal Film]		
RJ2	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ4	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ8	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ9	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ10	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ13	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ14	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ15	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ16	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ17	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ19	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ21	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ24	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ26	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ28	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ32	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ33	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ35	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ37	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ38	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ41	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ42	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ43	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ46	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ49	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ50	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ51	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ52	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ53	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ55	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ71	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ73	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ75	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ76	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ77	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ78	VRS-CY1JF000J	00, 1/16W M-Ox.
RJ1010	VRS-CY1JF000J	00, 1/16W M-Ox.
R201	VRS-CY1JF101J	100, 1/16W M-Ox.
R202	VRS-CY1JF101J	100, 1/16W M-Ox.
R205	VRS-CY1JF680J	68, 1/16W M-Ox.
R206	VRS-CY1JF122J	1.2k, 1/16W M-Ox.
R207	VRS-CY1JF221J	220, 1/16W M-Ox.
R208	VRS-CY1JF122J	1.2k, 1/16W M-Ox.
R209	VRS-CY1JF392J	3.9k, 1/16W M-Ox.
R216	VRS-VV3LB223J	22k, 3W M-Ox.
R219	VRD-RA2BE392J	3.9k, 1/8W Carbon
R220	VRS-CY1JF221J	220, 1/16W M-Ox.
R230	VRS-CY1JF473J	47k, 1/16W M-Ox.
R231	VRD-RA2BE681J	680, 1/8W Carbon
R232	VRS-CY1JF272J	2.7k, 1/16W M-Ox.
R233	VRS-CY1JF101J	100, 1/16W M-Ox.
R234	VRS-CY1JF391J	390, 1/16W M-Ox.
R257	VRS-CY1JF181J	180, 1/16W M-Ox.
R258	VRS-CY1JF181J	180, 1/16W M-Ox.
R259	VRS-CY1JF471J	470, 1/16W M-Ox.
R260	VRS-CY1JF392J	3.9k, 1/16W M-Ox.
R261	VRS-CY1JF223J	22k, 1/16W M-Ox.
R262	VRS-CY1JF560J	56, 1/16W M-Ox.
R263	VRS-CY1JF560J	56, 1/16W M-Ox.
R301	VRS-CY1JF101J	100, 1/16W M-Ox.

Ref. No.	Part No.	Description
PWB-A: DUNTKA541WEB3 MAIN UNIT (Continued)		
R304	VRS-CY1JF683J	68k, 1/16W M-Ox.
R305	VRS-CY1JF274J	270k, 1/16W M-Ox.
R307	VRS-CY1JF000J	00, 1/16W M-Ox.
R310	VRD-RA2BE473J	47k, 1/8W Carbon
R311	VRS-CY1JF473J	47k, 1/16W M-Ox.
R313	VRS-CY1JF102J	1.0k, 1/16W M-Ox.
R314	VRS-CY1JF103J	10k, 1/16W M-Ox.
R315	VRS-CY1JF822J	8.2k, 1/16W M-Ox.
R322	VRS-CY1JF272J	2.7k, 1/16W M-Ox.
R323	VRD-RA2BE274J	270k, 1/8W Carbon
R333	VRS-CY1JF101J	100, 1/16W M-Ox.
R334	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R335	VRS-CY1JF564J	560k, 1/16W M-Ox.
R364	VRS-CY1JF000J	00, 1/16W M-Ox.
R431	VRS-CY1JF101J	100, 1/16W M-Ox.
R432	VRS-CY1JF750J	75, 1/16W M-Ox.
R501	VRD-RA2BE222J	2.2k, 1/8W Carbon (20V-L110M)
R501	VRD-RA2BE562J	5.6k, 1/8W Carbon (21V-L110M)
R502	VRD-RM2HD102J	1.0k, 1/2W Carbon
R503	VRN-VV3DB2R2J	2.2, 2W M-Film (20V-L110M)
R503	VRN-VV3AB2R2J	2.2, 1W M-Film (21V-L110M)
R504	VRS-CY1JF181J	180, 1/16W M-Ox.
R505	VRS-CY1JF102J	1.0k, 1/16W M-Ox.
R506	VRS-VV3AB391J	390, 1W M-Ox.
R507	VRN-VV3AB1R0J	1.0, 1W M-Film
R511	VRS-CY1JF181J	180, 1/16W M-Ox.
R512	VRD-RM2HD100J	10, 1/2W Carbon (20V-L100M)
R512	VRD-RM2HD5R6J	5.6, 1/2W Carbon (21V-L100M)
R529	VRD-RA2BE223J	22k, 1/8W Carbon
R530	VRS-CY1JF334J	330k, 1/16W M-Ox.
R531	VRS-CY1JF101J	100, 1/16W M-Ox.
R532	VRS-CY1JF101J	100, 1/16W M-Ox.
R533	VRD-RA2BE393J	39k, 1/8W Carbon
R601	VRS-SV2HC102J	1.0k, 1/2W M-Ox.
R602	VRD-RA2BE393J	39k, 1/8W Carbon
R603	VRD-RA2BE223J	22k, 1/8W Carbon
R604	VRD-RA2BE393J	39k, 1/8W Carbon
R605	VRD-RM2HD823J	82k, 1/2W Carbon
⚠ R606	VRN-VV3AB2R2J	2.2, 1W M-Film (20V-L110M)
⚠ R606	VRN-VV3AB1R2J	1.2, 1W M-Film (21V-L110M)
⚠ R607	VRD-RM2HD270J	27, 1/2W Carbon
⚠ R609	VRD-RA2BE154J	150k, 1/8W Carbon
⚠ R610	VRD-RA2BE102G	1.0k, 1/8W Carbon
R611	VRS-CY1JF102J	1.0k, 1/16W M-Ox.
R612	VRS-CY1JF123J	12k, 1/16W M-Ox.
R613	VRS-CY1JF103J	10k, 1/16W M-Ox.
⚠ R614	VRS-SV2HC100J	10, 1/2W Carbon
R615	VRS-VV3DB682J	6.8k, 2W M-Ox.
R616	VRN-VV3ABR47J	0.47, 1W M-Film
R618	VRS-VV3DB391J	390, 2W M-Ox.
R619	VRS-VV3LB562J	5.6k, 3W M-Ox.
R620	VRS-VV3AB472J	4.7k, 1W M-Ox.
R622	VRD-RA2BE102J	1.0k, 1/8W Carbon
R625	VRN-VV3DB4R7J	4.7, 2W M-Film
R626	VRD-RM2HD470J	47, 1/2W Carbon
R641	VRN-SV2HBR47J	0.47, 1/2W M-Film
R651	VRS-CY1JF223J	22k, 1/16W M-Ox.
R652	VRS-CY1JF102J	1.0k, 1/16W M-Ox.
R653	VRS-CY1JF822J	8.2k, 1/16W M-Ox.
R654	VRS-CY1JF273J	27k, 1/16W M-Ox.
R655	VRS-CY1JF391J	390, 1/16W M-Ox.
R656	VRS-CY1JF100J	10, 1/16W M-Ox.
R658	VRD-RA2BE101J	100, 1/8W Carbon
R663	VRD-RA2BE101J	100, 1/8W Carbon
R701	VRW-KQ3NC3R9K	3.9, 7W Cement
R703	VRS-KT3LB473J	47k, 3W M-Ox.
R704	VRN-SV2HC1R0J	1.0, 1/2W M-Film
R707	VRS-VV3DB104J	100k, 2W M-Ox.
R708	VRD-RA2BE681J	680, 1/8W Carbon
R709	VRN-VV3DBR47J	0.47, 2W M-Film
R710	VRN-VV3DBR39J	0.39, 2W M-Film
R711	VRD-RA2BE682J	6.8k, 1/8W Carbon
R712	VRD-RA2BE152J	1.5k, 1/8W Carbon
R716	VRD-RA2BE562J	5.6k, 1/8W Carbon
⚠ R751	RR-DZ0049CEZZ	3.9, 1/2W Solid
⚠ R752	RR-DZ0049CEZZ	3.9, 1/2W Solid
⚠ R753	VRD-RM2HD124J	120k, 1/2W Carbon
R754	VRD-RM2HD150J	15, 1/2W Carbon
R755	VRD-RA2BE221J	220, 1/8W Carbon
R756	VRD-RM2HD270J	27, 1/2W Carbon
R757	VRS-CY1JF151J	150, 1/16W M-Ox.
R801	VRS-CY1JF221J	220, 1/16W M-Ox.
R802	VRS-CY1JF221J	220, 1/16W M-Ox.
R803	VRS-CY1JF221J	220, 1/16W M-Ox.
R804	VRS-CY1JF221J	220, 1/16W M-Ox.
R805	VRS-CY1JF822J	8.2k, 1/16W M-Ox.
R806	VRS-CY1JF123J	12k, 1/16W M-Ox.
R807	VRS-CY1JF103J	10k, 1/16W M-Ox.
R808	VRS-CY1JF221J	220, 1/16W M-Ox.
R809	VRD-RA2BE224J	220k, 1/8W Carbon
R812	VRS-CY1JF101J	100, 1/16W M-Ox.
R813	VRS-CY1JF221J	220, 1/16W M-Ox.
R1002	VRS-CY1JF822J	8.2k, 1/16W M-Ox.
R1003	VRS-CY1JF562J	5.6k, 1/16W M-Ox.
R1006	VRS-CY1JF562J	5.6k, 1/16W M-Ox.
R1007	VRS-CY1JF562J	5.6k, 1/16W M-Ox.

Ref. No.	Part No.	Description
PWB-A: DUNTKA541WEB3 MAIN UNIT (Continued)		
R1008	VRS-CY1JF822J	8.2k, 1/16W M-Ox.
R1009	VRS-CY1JF562J	5.6k, 1/16W M-Ox.
R1011	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R1012	VRD-RA2BE391J	390, 1/8W Carbon
R1013	VRD-RA2BE101J	100, 1/8W Carbon
R1014	VRS-CY1JF101J	100, 1/16W M-Ox.
R1015	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R1016	VRS-CY1JF101J	100, 1/16W M-Ox.
R1017	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R1019	VRS-CY1JF000J	00, 1/16W M-Ox.
R1020	VRS-CY1JF101J	100, 1/16W M-Ox.
R1021	VRS-CY1JF183J	18k, 1/16W M-Ox.
R1022	VRS-CY1JF101J	100, 1/16W M-Ox.
R1023	VRS-CY1JF221J	220, 1/16W M-Ox.
R1024	VRS-CY1JF183J	18k, 1/16W M-Ox.
R1025	VRS-CY1JF101J	100, 1/16W M-Ox.
R1026	VRS-CY1JF224J	220k, 1/16W M-Ox.
R1032	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R1034	VRS-CY1JF101J	100, 1/16W M-Ox.
R1035	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R1036	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R1037	VRS-CY1JF101J	100, 1/16W M-Ox.
R1038	VRS-CY1JF101J	100, 1/16W M-Ox.
R1039	VRS-CY1JF223J	22k, 1/16W M-Ox.
R1040	VRS-CY1JF101J	100, 1/16W M-Ox.
R1041	VRS-CY1JF101J	100, 1/16W M-Ox.
R1042	VRD-RA2BE471J	470, 1/8W Carbon
R1046	VRS-CY1JF101J	100, 1/16W M-Ox.
R1047	VRS-CY1JF332J	3.3k, 1/16W M-Ox.
R1050	VRS-CY1JF392J	3.9k, 1/16W M-Ox.
R1051	VRS-CY1JF683J	68k, 1/16W M-Ox.
R1066	VRS-CY1JF273J	27k, 1/16W M-Ox.
R1072	VRS-CY1JF101J	100, 1/16W M-Ox.
R1073	VRS-CY1JF101J	100, 1/16W M-Ox.
JA721	VRD-RA2BE102J	1.2k, 1/8W Carbon
	SWITCHES	
S1001	QSW-K0003AJZZ	Switch, CH UP
S1002	QSW-K0003AJZZ	Switch, CH DOWN
S1003	QSW-K0003AJZZ	Switch, VOL UP
S1004	QSW-K0003AJZZ	Switch, VOL DOWN
S1005	QSW-K0003AJZZ	Switch, PIC/PRESET
S702	QSW-P0591CEZZ	Switch, POWER
	MISCELLANEOUS PARTS	
⚠ F701	QFS-C3229CEZZ	Fuse, T3.15AL
FB331	RBLN-0091CEZZ	Ferrite Bead
FB601	RBLN-0091GEZZ	Ferrite Bead
FB751	RBLN-0091CEZZ	Ferrite Bead
FB752	RBLN-0036CEZZ	Ferrite Bead
FH701	QFSHD1013CEZZ	Fuse Holder
FH702	QFSHD1014CEZZ	Fuse Holder
J402	QJAKE0210CE04	Jack, Front Video
J403	QJAKE0210CE09	Jack, Front Audio
J409	QJAKFA004WJZZ	Jack, Rear AV-In
P302	QPLGN0441CEZZ	Plug, 4-pin (S)
P601	QPLGN0660CEZZ	Plug, 6-pin (F)
P603	QPLGN0341CEZZ	Plug, 3-pin (TP651-3)
P701	QPLGN0260CEZZ	Plug, 2-pin
P702	QPLGN0269GEZZ	Plug, 2-pin
P1002	QPLGN0541CEZZ	Plug, 5-pin (BC)
RMC1001	RRMCU0222CEZZ	R/C Receiver
RDA301	PRDAR0119GJFW	Heatsink for IC301
RDA501	PRDAR0118GJFW	Heatsink for IC501
RDA602	PRDAR224PEFW	Heatsink for Q602
RDA701	PRDAR0298PEFW	Heatsink for IC701
TP201	QLUGP0102PEZZ	Lug, Test Point
	LHLDP1066PE00	LED Holder
	LHLDW1104PEZZ	Holder (H-wire)
	LHLDW1105PEZZ	Holder (K-wire)
	LX-BZ3049GEFD	Screw
	LX-BZ0086TAFD	Screw
	LX-TZ3004CEFD	Screw
	QCNW-2619PEZZ	K-wire (20V-L110M)
	QCNW-A288WJZZ	K-wire (21V-L110M)
	QCNW-2620PEZZ	H-wire
	RBLN-A004WJZZ	Bead Ring (D751)

Ref. No.	Part No.	Description
PWB-B: DUNTKA542WEA2 CRT UNIT		
	TRANSISTORS	
Q870	RH-TX0110BMZZ	TX0110BM
Q871	RH-TX0110BMZZ	TX0110BM
Q872	RH-TX0110BMZZ	TX0110BM
Q883	RH-TX0124BMZZ	TX0124BM
Q885	RH-TX0124BMZZ	TX0124BM
Q887	RH-TX0124BMZZ	TX0124BM
	DIODES	
D881	VHD1SS244//-1	Diode
D882	VHD1SS244//-1	Diode
D883	VHD1SS244//-1	Diode
D884	VHD1SS119//-1	Diode
D885	VHD1SS119//-1	Diode
D886	VHD1SS244//-1	Diode
D887	VHD1SS244//-1	Diode
D888	VHD1SS244//-1	Diode
	CAPACITORS	
	[EL. …Electrolytic]	
C871	VCCSCY1HL471J	470p, 50V Ceramic
C872	VCCSCY1HL471J	470p, 50V Ceramic
C873	VCCSCY1HL471J	470p, 50V Ceramic
C875	VCKYPA2HB102K	1000p, 500V Ceramic
C876	RC-KZ0150CEZZ	1000p, 3kV Ceramic
C878	VCEA0A2EW106M	10, 250V EL.
C880	VCCSCY1HL471J	470p, 50V Ceramic
C881	VCKYPA1HB471K	470p, 50V Ceramic
C882	VCKYPA1HB471K	470p, 50V Ceramic
C886	VCKYPA2HB102K	1000p, 500V Ceramic
	RESISTORS	
	[M-Ox. …Metal Oxide]	
R879	VRS-CY1JF471J	470, 1/16W M-Ox.
R880	VRS-CY1JF471J	470, 1/16W M-Ox.
R881	VRS-CY1JF471J	470, 1/16W M-Ox.
R882	VRS-VV3DB153J	15k, 2W M-Ox.
R883	VRD-RM2HD272J	2.7k, 1/2W Carbon
R884	VRS-VV3DB153J	15k, 2W M-Ox.
R885	VRD-RM2HD272J	2.7k, 1/2W Carbon
R886	VRS-VV3DB153J	15k, 2W M-Ox.
R887	VRD-RM2HD272J	2.7k, 1/2W Carbon
R888	VRS-CY1JF471J	470, 1/16W M-Ox. (20V-L110M)
R892	VRS-CY1JF102J	1.0k, 1/16W M-Ox.
R893	VRS-CY1JF102J	1.0k, 1/16W M-Ox.
R894	VRS-CY1JF102J	1.0k, 1/16W M-Ox.
R895	VRS-CY1JF471J	470, 1/16W M-Ox. (21V-L110M)
R896	VRS-CY1JF471J	470, 1/16W M-Ox. (21V-L110M)
R898	VRS-CY1JF471J	470, 1/16W M-Ox. (20V-L110M)
R899	VRS-CY1JF471J	470, 1/16W M-Ox.

Ref. No.	Part No.	Description
	MISCELLANEOUS PARTS	
⚠SC881	QSOCV0840CEZZ	CRT Socket (20V-L110M)
⚠SC881	QSOCV0933CEZZ	CRT Socket (21V-L110M)

MISCELLANEOUS PARTS

Ref. No.	Part No.	Description
	LANGB0207PJFW	CRT Bracket
	LHLDW1003PEZZ	Wire Holder
	LHLDW1009PEZZ	Wire Holder
	LHLDW1033PEZZ	Wire Holder
	LHLDW1060PEZZ	Wire Holder
	LHLDZ0063PEZZ	H/V Holder
	LX-NZ3043CEFD	CRT nut
	PSPAG0001PE00	CRT Rubber Washer
⚠	QACCU0206PJZZ	AC Cord
	QPGV-0401PJZZ	S Wire
	RSPF-0105PJZZ	Speaker
	TLABM0640PJZZ	Model Label (20V-L110M)
	TLABM0641PJZZ	Model Label (21V-L110M)
	TLABN0106PFZZ	Serial No. List
	TLSTS2000PLZZ	Service List
	UBATC0001PJZZ	AA SHD Battery
	XTASD40P12000	Speaker Screw
	XTASD50P20000	CRT Bracket Screw

SUPPLIED ACCESSORIES

	QANTD2001PJZZ	Dipole Antenna
	RRMCG1339CESB	Remote Control
	RTRNZ0004PJZZ	Matching X-former
	TINSE0624PJZZ	Operation Manual

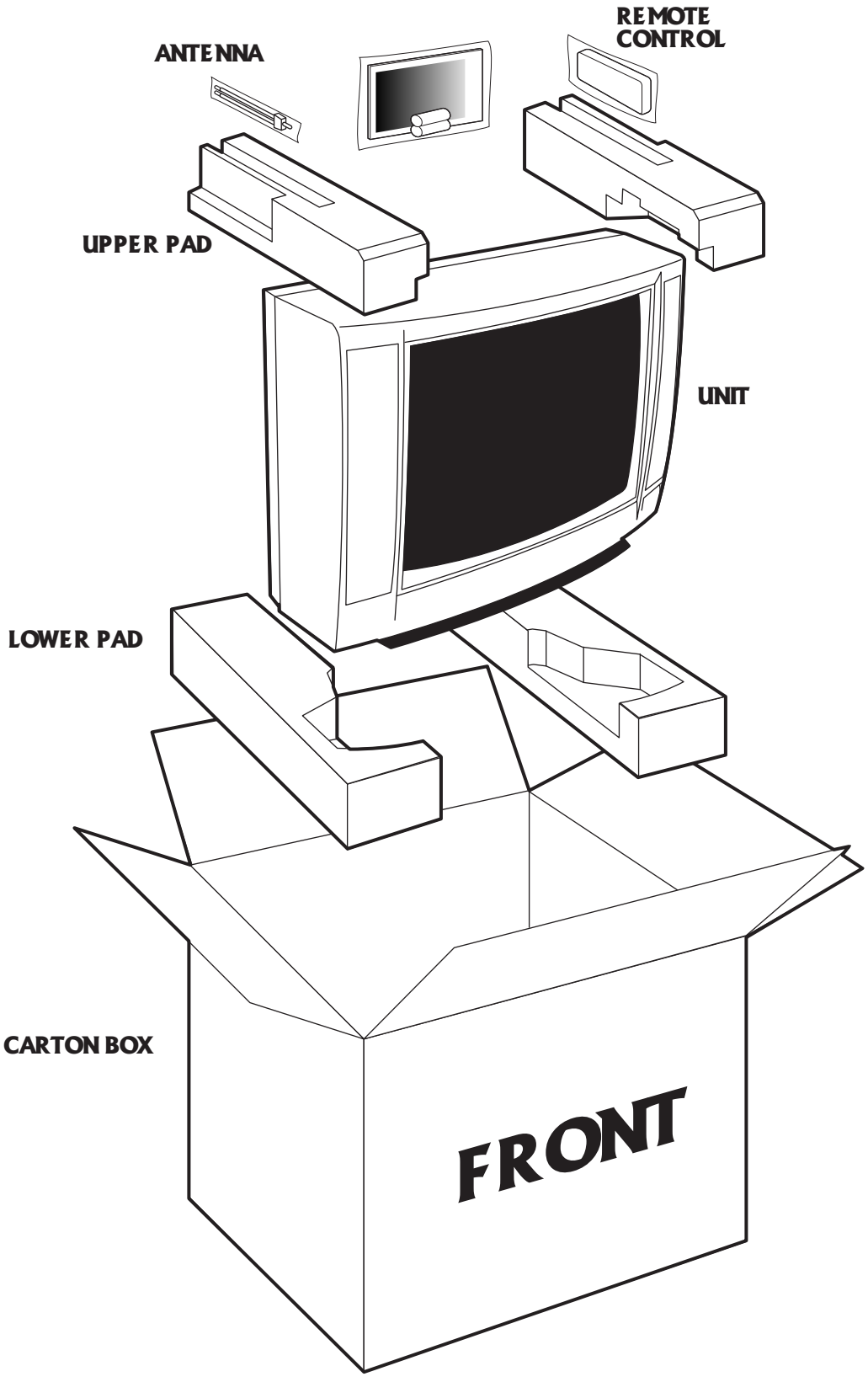
PACKING PARTS
(NOT REPLACEMENT ITEM)

	SPAKA0653PJZZ	Pack-Ad
	SPAKC0836PJZZ	Packing Case (20V-L110M)
	SPAKC0837PJZZ	Packing Case (21V-L110M)
	SSAKA0172PFZZ	Polybag for OM
	SSAKH0207PJZZ	Polybag For Unit

CABINET PARTS

Ref. No.	Part No.	Description
	GCABA0335PJSA	Front Cabinet (20V-L110M)
	GCABA0336PJSA	Front Cabinet (21V-L110M)
	GCABB0324PJSA	Rear Cabinet
	HBDGB0206PJSA	Sharp Badge
	HDECQ0314PJOT	R/C Deco Cover
	JBTNC0105PJSA	Control Button A
	JBTNC0106PJSA	Control Button B
	JBTNP0119PJSA	Power Button
	LX-TZ3004CEFD	Screw
	LX-TZ3004CEFD	Screw for AV
	MSPRC0148PJFW	Spring for Pow But
	XTASD40P20000	Screw for Cabinet

PACKING OF THE SET



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